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**CLAIMS**

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**[Claim(s)]**

[Claim 1] A keeping means to have the torsion spring which it balances [ torsion spring ] with an aperture shoji and makes this aperture shoji stand it still in the location of arbitration, The sliding object to which an aperture shoji is connected with this keeping means, and it shows this aperture shoji up and down along with the door post of a sash, and a means for it to be included in this sliding inside of the body, and to adjust the keeping force of torsion spring are provided. The above-mentioned adjustment means The shaft which twists and adjusts torsion spring, and the lining puck which brakes this adjustment shaft and holds the keeping force, It has the cam side made to have been enough detached for the braking discharge [ \*\*\*\* / pushing for braking by revolution of the both directions of this lining puck on an adjustment shaft ] from an adjustment shaft. The above-mentioned adjustment shaft is inserted pivotable into the longitudinal hole of a sliding object, and the above-mentioned cam side is formed in the lower part of the above-mentioned longitudinal hole. The above-mentioned lining puck is inserted between an adjustment shaft and a cam side, and stands up to the revolution ring by which fitting was carried out to the adjustment shaft pivotable. They are the trimming devices of a vertical-movement aperture which the lever which makes this revolution ring rotate it in the damping force discharge direction is prepared, and have the spring with which the above-mentioned adjustment means makes a revolution ring always energize in the braking direction further.

[Claim 2] Said lining pucks are the trimming devices of the vertical-movement aperture according to claim 1 prepared so that it might correspond to each lining puck by which it was constituted so that it might be divided into plurality and an adjustment shaft might be surrounded, and said cam side was also divided. [ two or more ]

[Claim 3] The cam side of the longitudinal hole of said sliding object and the field of the lining puck in contact with this cam side are the trimming devices of the vertical-movement aperture according to claim 2 formed in the arc to which a radius becomes large as it goes to a hoop direction.

[Claim 4] The cylinder which it was further fixed to the door post of a sash, and the aforementioned keeping means surrounded said torsion spring, and fixed with the upper bed of the spring, The nut which only the revolution was connected with this cylinder possible, and fixed to the soffit of torsion spring, The spiral lever which was inserted possible [ vertical movement ] into torsion spring, and screwed with the above-mentioned nut, and was connected with the adjustment shaft pivotable in one is provided. These spiral levers are the trimming devices of the vertical-movement aperture according to claim 3 which rolls and fastens torsion spring through a nut at the time of the descent, and is raised through a nut by rewinding [ of torsion spring ].

[Claim 5] Said sliding objects are the trimming devices of the vertical-movement aperture according to claim 4 into which a braking means to make this sliding object brake automatically when an aperture shoji rotates horizontally from a perpendicular direction was built.

[Claim 6] said sliding — the trimming devices possessing the braking member which follows a revolution of the revolving shaft connected with an aperture shoji while the braking means of the body and its function is built into the above-mentioned sliding object, and the revolving shaft at the time of being included in the above-mentioned sliding object and an aperture shoji tilting horizontally from a perpendicular direction, and gives damping force to a sliding object of a vertical-movement aperture according to claim 5.

[Claim 7] Said revolving shaft has a cam side and said braking member has the cam abutment which receives the above-mentioned cam side. A revolution of a revolving shaft moves a braking member up and down. A slanting slideway on said sliding object again at the above-mentioned braking member this slideway top Trimming devices of a vertical-movement aperture according to claim 6 which make between the braking location where the sliding surface which slides aslant is prepared respectively, and the above-mentioned braking member is forced on it by

the door post of a sash in the case of the vertical movement, and the locations where the forcing is canceled reciprocate also in a longitudinal direction.

[Claim 8] Trimming devices possessing a locking means to be formed in the top rail of an aperture shoji and to prevent tilting of this aperture shoji of a vertical-movement aperture according to claim 7.

[Claim 9] They are the trimming devices of the vertical-movement aperture according to claim 8 which has the field which the above-mentioned locking rod makes the cylinder of the aforementioned keeping member a slideway, and fits in possible [ sliding ] by said locking means possessing the spring which energizes the case fixed to the top rail of an aperture shoji, the locking rod incorporated possible [ sliding in this case ], and this locking rod in a projection location, and is pinched in the guide rail of the door post of a sash, and will be in a locking condition.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[Industrial Application]

This invention relates to the trimming devices of a vertical-movement aperture.

[Description of the Prior Art]

A vertical-movement aperture hangs each other, in equipment, the thing with an aperture shoji used for hanging each other is known in the torque of torsion spring, and there are a thing it was made to make adjustment of the torque rotate an adjustment shaft to an one direction by the ratchet mechanism, and a thing which gave the damping force by the tight-binding force of a coiled form brake spring to the adjustment shaft.

Moreover, in what rotates the aperture shoji of a vertical-movement aperture horizontally from a perpendicular direction, the trimming devices possessing a braking means to give damping force to this aperture shoji in the case of tilting of the trimming devices possessing the adjustment means of the keeping force of the keeping means for aperture shojis and this means, and the above-mentioned keeping means and an aperture shoji, and to fix to the location are known.

[Problem(s) to be Solved by the Invention]

In the above-mentioned conventional trimming devices, although the thing using a ratchet mechanism is convenient for eye winding up of torsion spring, rewinding of it is impossible and it cannot adjust a torque proper. Although both eye winding up of torsion spring and rewinding can do the thing using a brake spring, torsion spring is automatically rewound by reduction of the damping force by the uncertainty of the damping force of the brake spring, or weakening of a brake spring, as a result it becomes impossible to use it, and actuation of eye winding up of torsion spring or rewinding cannot be performed lightly because of a brake spring, it is heavy and the assembly of a brake spring is not still easier.

Moreover, the thing which lacks the braking means although it hangs and \*\*\*\*\* is provided in that by which an aperture shoji falls down on the order other than vertical movement The keeping collapses., if it fishes with a keeping means and a \*\*\*\*\* shoji is made to tilt What lacks the adjustment means although a large intermediary shoji goes up more relatively [ the raising force of a \*\*\*\* means ] than the reduction force of a shoji and the above-mentioned keeping means and a braking means are provided Moreover, since the latter lacks the adjustment means, adjustment of change of the force of a keeping means and the keeping means according a shoji to adjustment of the keeping means after \*\*\*\*\* or an activity in a sash cannot be performed. Thus, for the conventional trimming devices, a problem is \*\*\*\*\* to anything.

Adjustment of \*\*\*\*\* of the keeping means for the apertures of vertical movement can do this invention certainly and easily, and lightly moreover. While a cotton intermediary is also made certainly at the period when maintenance of \*\*\*\*\* is also long and an aperture shoji and a keeping means can use adjustment of a keeping means as a sash also in the state of assembly \*\*\*\* further When an aperture shoji is made to tilt, it is going to offer the convenient trimming devices at which damping force is automatically given to this shoji and keeping of an aperture shoji is maintained.

[The means for solving a technical problem]

A \*\*\*\* means to have the torsion spring mutually hung with an aperture shoji in order that this invention may attain the above-mentioned object, The sliding object which connects an aperture shoji with this keeping means, and shows this aperture shoji to the \*\*\*\*\* upper and lower sides at the door post of a sash, Providing a means for it to be included in this sliding inside of the body, and to adjust the keeping force of torsion spring, the above-mentioned adjustment means includes the cam side the adjustment shaft for \*\*\*\*\* of torsion spring, the lining puck for these adjustment shafts, and for actuation of this lining puck.

this invention — further — tilting the front or behind an aperture shoji — therefore, a braking means to brake a sliding object automatically is provided.

It explains concretely, referring to a drawing per example of this invention below.

An outside aperture shoji (1) and an inside aperture shoji (2) carry out \*\*\*\*\* vertical movement in the guide rail (5) of the door post (4) of a sash (3), (5), and ( drawing 4 ), an outer window shoji closes the upper part of an aperture, and closing and a bottom aperture shoji close the lower part of an aperture. Each aperture shoji (1) and (2) are hung by the door post (4) in the state of keeping in the keeping member (6) which hangs each other and is used as a means, (7), and ( drawing 2 ), and they stand it still in the location of arbitration.

Since the structure of a keeping member (6) and (7) is the same only by dimensions differing so that an internal and external shoji (1) and (2) may be suited, the thing for inside shojis (2) is mainly explained. The same is said of other members.

The cylinder by which it hangs each other, a member (6) and (7) are prolonged in the vertical direction, and an upper bed is connected with a door post (4) in a pin (8), and ( drawing 2 and drawing 3 ) (9), The nut (10) with which only the revolution was connected with this cylinder and the soffit possible, and the spiral lever which it is inserted possible [ vertical movement ] into the above-mentioned cylinder, and the soffit penetrates a nut (10) in the state of screwing, and projects from the soffit of a cylinder (9) to the method of outside (11), The torsion spring (15) which has the upper bed (13) around which the spiral lever (11) was looped within the above-mentioned cylinder (9), and which fixed through the spring stop member (12) in the cylinder (9), and the soffit (14) which fixed in the nut (10) is provided. A spiral lever (11) rotates a nut (10) by the drop, and rolls and fastens torsion spring (15), and torsion spring (15) reverses a nut (10) by the rewinding, and it commits it so that a spiral lever (11) may be raised. A spiral lever (11) is connected with a shoji (1) and (2), and if the torque which balances with torsion spring (15) in a shoji (1), (2), and its maximum climb location is given, torsion spring (15) can always be hung with a shoji, can make a \*\*\*\*\* shoji able to stand it still in the location of arbitration, and, moreover, can make a shoji go up and down by the small force.

The sliding object (16) is mainly constituted from a tubed part (18) formed in one by the part (17) and this part of a \*\*\*\* rectangular parallelepiped, and is built into them possible [ sliding in the guide rail (5) of the door post (4) of a sash ].

A rectangular parallelepiped part (17) has the sliding slot (20) of the vertical direction formed in the parallel flat surface (19) mutually [ the both sides ], fits into the flange (21) which this sliding slot expects to the effective area of the guide rail (5) of a door post (4), and (drawing 11) possible [ sliding ], and makes a guide rail (5) carry out \*\*\*\*\* vertical movement of the sliding object (16). The flat surface (22) which intersects perpendicularly with the both-sides flat surface (19) of a rectangular parallelepiped part (17) is connected so that it has a bearing hole (23) and ( drawing 7 ) in the lower part, and fitting of the revolution of a revolving shaft (24) may be made free into this bearing hole, fitting of the connection arm (26) may be carried out to the communicating pore (25) of this revolving shaft and a connection arm and a revolving shaft may be rotated in one. A connection arm (26) fixes from the soffit of the stile (27) of a shoji (2) by cotton intermediary \*\*\*\*\* to a kicking rail (28), it makes a shoji a center of rotation and a revolving shaft (24) is tilted to an interior-of-a-room side from a vertical position to a horizontal position in it. The lateral surface of the glass (29) of a shoji (2) can be cleaned safely [ in an interior-of-a-room side ] and easily by the tilting.

It has an amplification hole (31a) ( drawing 7 ). the bearing hole (31) and this bearing hole which penetrated a part for a tubed part (18) in the vertical direction — reams — While the adjustment shaft (32) used as an adjustment means for torsion spring (15) in this bearing hole and an amplification hole is inserted pivotable and the shank (33) of the upper bed projects from a part for a tubed part (18) to the upper part, a part of shank (34) of a soffit has projected under [ for a tubed part (18) ]. A shank (35) to the shank (33) of the upper bed to which an adjustment shaft (32) fits into the bearing hole (31) for a tubed part (18) is the same diameter, and the downward shank (34) is formed in the bigger diameter than a bearing hole (31) and a shank (35) from the bearing hole (31) ( drawing 7 ). When an adjustment shaft (32) is inserted from a lower part into a bearing hole (31), a shank (34), (35) The step (36) of a between dashes against the step (37) between a bearing hole (31) and an amplification hole (31a). The migration to the upper part of an intermediary adjustment shaft (32) Stop, The circular sulcus (39) of the adjustment shaft (32) corresponding to the location of the upper bed peristome (38) of a bearing hole (31) is made to carry out fitting of the lock ring (40), migration in the lower part of an adjustment shaft (32) is prevented, and only a revolution assembles an adjustment shaft (32) possible in a bearing hole (31). As for the upper bed of an adjustment shaft (32), the slot (41) of a cross-joint form and (42) are prepared. The soffit of a spiral lever (11) is inserted in one slot (41), it connects with the hole (44) of a spiral lever, and the

screw-thread hole (45) of an adjustment shaft (32) mutually through a set screw (43), and the pin (46) attached in the right angle is inserted in a spiral lever (11) in the slot on another side (42). Thereby, while an adjustment shaft (32) is hung by the spiral lever (11), a sliding object (16) is hung, a sliding object (16) supports a shoji (2) through a revolving shaft (24) and a connection arm (26), and the shoji (2) is lifted by the keeping member (7). The adjustment means of the torque of the torsion spring (15) of a keeping member (7) possesses the cam side (51) which forces on an adjustment shaft the lining puck (50) which gives damping force to the adjustment shaft other than the above-mentioned adjustment shaft (32), and this lining puck. The lining puck (50) stood up to the revolution ring (52) at one at four-piece regular intervals so that the surroundings of an adjustment shaft (32) might be surrounded, and the lever (53) is radially prolonged from this revolution ring. The cam side (51) is formed in four-piece regular intervals so that it may correspond to the inner skin of the amplification hole (31a) of a sliding object (16) at a lining puck (50). a cam side (51) and the outside surface (54) of the lining puck (50) in contact with this cam side are formed in the arc which goes to a hoop direction and to which it is alike, and it follows and a radius becomes large — having — intermediary \*\*\*\* with the die length of an outside (54) arc shorter than that of a cam side (51) — the intermediary splash also of the play can be carried out relatively. The inner surface (55) of a lining puck (50) is formed in the arc gestalt which can contact exactly the peripheral surface of the shank (34) of an adjustment shaft (32). Fitting of the lining puck (50) is carried out into the amplification hole (31a) surrounded in respect of the cam (51). Fitting of the shank (34) of an adjustment shaft (32) was carried out into the hole (56) surrounded by the lining puck (50), and the ring (52), and the lever (53) penetrated the aperture (57) formed in the rectangular parallelepiped part (17) of a sliding object (16), and has projected from the flat surface (22) to the method of outside. By a lever (53) being rockable between the ends (58) of an aperture (57), and (59), and a lever (53) dashing against the end (58) of an aperture (57), a lining puck (50) is in a neutral condition without the outside surface's (54)'s contacting a cam side (51), the inner surface (55) of a lining puck is not forced on an adjustment shaft (32) at the time of intermediary \*\*\*\*, but an adjustment shaft is in the condition of not braking. If it is made to rotate until it dashes a lever (53) in the direction of an arrow head (A) at the other end (59) of an aperture (57), the outside surface (54) is pushed in respect of a cam (51), and a lining puck (50) binds an adjustment shaft (32) tight inside (55), and will be in a braking condition. Fitting was carried out to the periphery of a lining puck (50), the end (61) was hooked on the lever (51), the other end (62) was hooked on the edge (58) of an aperture (57), and the volume spring (60) has always given the turning effort to the direction braked to a lining puck (50), and holds the braking condition of an adjustment shaft (32).

An adjustment shaft (32) has a slotted hole (graphic display abbreviation) in that soffit side, inserts the edge of a blade of a driver in this slotted hole, and rotates. If the torque of torsion spring (15) will increase if the damping force over this shaft is made in the condition of being canceled by actuation (an arrow head A and opposite direction) of a lever (53) and turns an adjustment shaft (32) counterclockwise, and a revolution of an adjustment shaft (32) turns clockwise, a torque will decrease. In addition, it is also made that rewinding [ of torsion spring (15) ] cancels the damping force over an adjustment shaft (32). Thus, the torque of torsion spring (32) is adjusted so that it may balance with a shoji proper.

As a braking means to follow the tilting and to give damping force automatically to an aperture shoji, a lateral slot (65) is formed in the flat surface (22) of the rectangular parallelepiped part (17) of a sliding object (16), opening of the ends is carried out to the flat surface (19) of the both sides of a sliding object, and the amount of [ of a slot (65) ] center section is further open for free passage to the bearing hole (23). A braking member (66) is included in this slot (65), and a revolution of a revolving shaft (24) makes this braking member follow in a braking location. As a braking member (66) is shown in drawing 10, a rectangular parallelepiped part (67) and the braking part (68) of the \*\*\*\* right triangle which protruded on the both sides at one are provided. A rectangular parallelepiped part (67) has the arc side (69) which fits into a part for the tubed part of a sliding object (16) (18), the arc side (71) which fits into the flange (70) of a revolving shaft (24), and the cam abutment (72) of a water plane. A revolving shaft (24) has the flange (76) of the back end of the cam side (75) formed at the flat surface (74) which cut and lacked a periphery side (73) and its part in common, and a flat surface (74). the cam side (75) of a revolving shaft (24) — the cam abutment (72) of a braking member (66) — biting — a revolution of \*\*\*\*\* and a revolving shaft (24) — therefore, a braking member (66) is moved up and down. It bites at the tooth back of a cam abutment (72), and, as for the flange (76) of a revolving shaft (24), only the revolution holds the \*\*\*\*\* revolving shaft (24) possible. A braking part (68) has a braking side (78) vertical to a slanting sliding surface (77). It gears with the slideway (79) of the slant in the inner part of a slot (65), and the above-mentioned sliding surface (77) is extruded to the front, when it goes up, and when descending, it shows back a braking member

(66) to it. the above-mentioned braking side (78) — a braking member (66) — a downward location — \*\* — it does not contact [ whether it consists in a way among one sliding surfaces (80) of the sliding slot (20) of a sliding object (16) at the time of intermediary \*\*\*\*, and the flange (21) of a door post (4) is contacted lightly, and ] at all. When a braking member (66) goes up, a braking side (78) is forced on the flange (21) of a door post (4), it gives damping force to a sliding object (16), and it is made to stop it. Damping force is held once in the horizontal position \*\*(ing) by this, when a shoji (2) is made to tilt to a horizontal position from a vertical position.

A locking means is formed in the top rail (82) and (82), and a shoji (1) and (2) prevent that a shoji rotates to the circumference of a revolving shaft (24) by locking of this means, and they permit a revolution of a shoji in release. The locking member (83) as this locking means possesses the helical compression spring (88) which energizes the locking rod (87) inserted possible [ sliding in the case (86) which consisted of a case body (84) and a base lid (85) which closes the effective area of that bottom, and this case ], and this locking rod (87) in the projection direction. A case body (84) and a base lid (85) are \*\*\*\*ed, it is combined by (89), and they are \*\*\*\*ed, and have fixed to the top rail (82) by (90). A locking rod (87) has a long hole (91), an impression (92), and a tongue (93). A long hole (91) \*\*\*\*s, surrounds (89) and (90), defines the stroke die length of frequent appearance of a locking rod (87), and a spring (88) is incorporated, the end of this spring gears on the wall surface of an impression (92), the other end blows an impression (92) to the bending piece (94) of a base lid (85), and it makes \*\*\*\*\* and a locking rod (87) project. The apical surface (95) of a locking rod (87) is formed in an arc, and this apical surface fits into a cylinder (9), and it moves up and down with a shoji (1) and (2) by making the cylinder into a slideway. This locking rod (87) is pinched by the flange (21) of the door post (4) of a sash, and (21), and prevents tilting of a shoji (1) and (2). The tongue (93) has projected upwards from the long hole (96) of a case body (84), and retreats a locking rod (87) in a lead-in location. By the retreat, a locking rod (87) moves outside from an engagement location with the flange (21) of the door post (4) of a sash, and enables tilting of a release condition, an intermediary, a shoji (1), and (2).

In addition, you may make it fixed [ which can perform neither vertical migration nor tilting ], and up-and-down medium is [ not a soffit but the upper bed of each shoji are sufficient as the center of rotation of a shoji (1) and (2), or ] sufficient as an outside shoji (1). It is also good to fall outside the others from which the hand of cut of a shoji also breaks down inside.

#### [Effect of the Invention]

As a means to adjust the torque of an aperture shoji and the torsion spring (15) hung mutually, this invention Since it is constituted so that a lining puck (50) is forced on the adjustment shaft (32) made to rotate torsion spring in respect of a cam (51), damping force may be given, or discharge of forcing of the lining puck may be enabled in a cam side and braking to an adjustment shaft may be made to cancel Adjustment of \*\*\*\*\* of the keeping means for the apertures of vertical movement can be performed certainly and easily, and lightly moreover, and a cotton intermediary is also certainly made also for maintenance of \*\*\*\*\* at a long period of time. this invention — further — tilting the front or behind an aperture shoji — therefore — since a braking means to brake automatically the sliding object (16) which connects an aperture shoji with a \*\*\*\* means is provided — keeping of an aperture shoji — which field of a vertical plane and the level surface — even if — it is maintained and is convenient.

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TECHNICAL FIELD

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[Industrial Application]

This invention relates to the trimming devices of a vertical-movement aperture.

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**PRIOR ART**

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**[Description of the Prior Art]**

A vertical-movement aperture hangs each other, in equipment, the thing with an aperture shoji used for hanging each other is known in the torque of torsion spring, and there are a thing it was made to make adjustment of the torque rotate an adjustment shaft to an one direction by the ratchet mechanism, and a thing which gave the damping force by the tight-binding force of a coiled form brake spring to the adjustment shaft.

Moreover, in what rotates the aperture shoji of a vertical-movement aperture horizontally from a perpendicular direction, the trimming devices possessing a braking means to give damping force to this aperture shoji in the case of tilting of the trimming devices possessing the adjustment means of the keeping force of the keeping means for aperture shojis and this means, and the above-mentioned keeping means and an aperture shoji, and to fix to the location are known.

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**EFFECT OF THE INVENTION**

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**[Effect of the Invention]**

As a means to adjust the torque of an aperture shoji and the torsion spring (15) hung mutually, this invention Since it is constituted so that a lining puck (50) is forced on the adjustment shaft (32) made to rotate torsion spring in respect of a cam (51), damping force may be given, or discharge of forcing of the lining puck may be enabled in a cam side and braking to an adjustment shaft may be made to cancel Adjustment of \*\*\*\*\* of the keeping means for the apertures of vertical movement can be performed certainly and easily, and lightly moreover, and a cotton intermediary is also certainly made also for maintenance of \*\*\*\*\* at a long period of time. this invention -- further -- tilting the front or behind an aperture shoji -- therefore -- since a braking means to brake automatically the sliding object (16) which connects an aperture shoji with a \*\*\*\* means is provided -- keeping of an aperture shoji -- which field of a vertical plane and the level surface -- even if -- it is maintained and is convenient.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention]

In the above-mentioned conventional trimming devices, although the thing using a ratchet mechanism is convenient for eye winding up of torsion spring, rewinding of it is impossible and it cannot adjust a torque proper. Although both eye winding up of torsion spring and rewinding can do the thing using a brake spring, torsion spring is automatically rewound by reduction of the damping force by the uncertainty of the damping force of the brake spring, or weakening of a brake spring, as a result it becomes impossible to use it, and actuation of eye winding up of torsion spring or rewinding cannot be performed lightly because of a brake spring, it is heavy and the assembly of a brake spring is not still easier.

Moreover, the thing which lacks the braking means although it hangs and \*\*\*\*\* is provided in that by which an aperture shoji falls down on the order other than vertical movement The keeping collapses., if it fishes with a keeping means and a \*\*\*\*\* shoji is made to tilt What lacks the adjustment means although a large intermediary shoji goes up more relatively [ the raising force of a \*\*\*\* means ] than the reduction force of a shoji and the above-mentioned keeping means and a braking means are provided Moreover, since the latter lacks the adjustment means, adjustment of change of the force of a keeping means and the keeping means according a shoji to adjustment of the keeping means after \*\*\*\*\* or an activity in a sash cannot be performed. Thus, for the conventional trimming devices, a problem is \*\*\*\*\* to anything.

Adjustment of \*\*\*\*\* of the keeping means for the apertures of vertical movement can do this invention certainly and easily, and lightly moreover. While a cotton intermediary is also made certainly at the period when maintenance of \*\*\*\*\* is also long and an aperture shoji and a keeping means can use adjustment of a keeping means as a sash also in the state of assembly \*\*\*\* further When an aperture shoji is made to tilt, it is going to offer the convenient trimming devices at which damping force is automatically given to this shoji and keeping of an aperture shoji is maintained.

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**MEANS**

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[The means for solving a technical problem]

A \*\*\*\* means to have the torsion spring mutually hung with an aperture shoji in order that this invention may attain the above-mentioned object, The sliding object which connects an aperture shoji with this keeping means, and shows this aperture shoji to the \*\*\*\*\* upper and lower sides at the door post of a sash, Providing a means for it to be included in this sliding inside of the body, and to adjust the keeping force of torsion spring, the above-mentioned adjustment means includes the cam side the adjustment shaft for \*\*\*\*\* of torsion spring, the lining puck for these adjustment shafts, and for actuation of this lining puck.

this invention — further — tilting the front or behind an aperture shoji — therefore, a braking means to brake a sliding object automatically is provided.

It explains concretely, referring to a drawing per example of this invention below.

An outside aperture shoji (1) and an inside aperture shoji (2) carry out \*\*\*\*\* vertical movement in the guide rail (5) of the door post (4) of a sash (3), (5), and ( drawing 4 ), an outer window shoji closes the upper part of an aperture, and closing and a bottom aperture shoji close the lower part of an aperture. Each aperture shoji (1) and (2) are hung by the door post (4) in the state of keeping in the keeping member (6) which hangs each other and is used as a means, (7), and ( drawing 2 ), and they stand it still in the location of arbitration.

Since the structure of a keeping member (6) and (7) is the same only by dimensions differing so that an internal and external shoji (1) and (2) may be suited, the thing for inside shojis (2) is mainly explained. The same is said of other members.

The cylinder by which it hangs each other, a member (6) and (7) are prolonged in the vertical direction, and an upper bed is connected with a door post (4) in a pin (8), and ( drawing 2 and drawing 3 ) (9), The nut (10) with which only the revolution was connected with this cylinder and the soffit possible, and the spiral lever which it is inserted possible [ vertical movement ] into the above-mentioned cylinder, and the soffit penetrates a nut (10) in the state of screwing, and projects from the soffit of a cylinder (9) to the method of outside (11), The torsion spring (15) which has the upper bed (13) around which the spiral lever (11) was looped within the above-mentioned cylinder (9), and which fixed through the spring stop member (12) in the cylinder (9), and the soffit (14) which fixed in the nut (10) is provided. A spiral lever (11) rotates a nut (10) by the drop, and rolls and fastens torsion spring (15), and torsion spring (15) reverses a nut (10) by the rewinding, and it commits it so that a spiral lever (11) may be raised. A spiral lever (11) is connected with a shoji (1) and (2), and if the torque which balances with torsion spring (15) in a shoji (1), (2), and its maximum climb location is given, torsion spring (15) can always be hung with a shoji, can make a \*\*\*\*\* shoji able to stand it still in the location of arbitration, and, moreover, can make a shoji go up and down by the small force.

The sliding object (16) is mainly constituted from a tubed part (18) formed in one by the part (17) and this part of a \*\*\*\* rectangular parallelepiped, and is built into them possible [ sliding in the guide rail (5) of the door post (4) of a sash ].

A rectangular parallelepiped part (17) has the sliding slot (20) of the vertical direction formed in the parallel flat surface (19) mutually [ the both sides ], fits into the flange (21) which this sliding slot expects to the effective area of the guide rail (5) of a door post (4), and (drawing 11) possible [ sliding ], and makes a guide rail (5) carry out \*\*\*\*\* vertical movement of the sliding object (16). The flat surface (22) which intersects perpendicularly with the both-sides flat surface (19) of a rectangular parallelepiped part (17) is connected so that it has a bearing hole (23) and ( drawing 7 ) in the lower part, and fitting of the revolution of a revolving shaft (24) may be made free into this bearing hole, fitting of the connection arm (26) may be carried out to the communicating pore (25) of this revolving shaft and a connection arm and a revolving shaft may be rotated in one. A connection arm

(26) fixes from the soffit of the stile (27) of a shoji (2) by cotton intermediary \*\*\*\*\* to a kicking rail (28), it makes a shoji a center of rotation and a revolving shaft (24) is tilted to an interior-of-a-room side from a vertical position to a horizontal position in it. The lateral surface of the glass (29) of a shoji (2) can be cleaned safely [ in an interior-of-a-room side ] and easily by the tilting.

It has an amplification hole (31a) ( drawing 7 ). the bearing hole (31) and this bearing hole which penetrated a part for a tubed part (18) in the vertical direction — reams — While the adjustment shaft (32) used as an adjustment means for torsion spring (15) in this bearing hole and an amplification hole is inserted pivotable and the shank (33) of the upper bed projects from a part for a tubed part (18) to the upper part, a part of shank (34) of a soffit has projected under [ for a tubed part (18) ]. A shank (35) to the shank (33) of the upper bed to which an adjustment shaft (32) fits into the bearing hole (31) for a tubed part (18) is the same diameter, and the downward shank (34) is formed in the bigger diameter than a bearing hole (31) and a shank (35) from the bearing hole (31) ( drawing 7 ). When an adjustment shaft (32) is inserted from a lower part into a bearing hole (31), a shank (34), (35) The step (36) of a between dashes against the step (37) between a bearing hole (31) and an amplification hole (31a). The migration to the upper part of an intermediary adjustment shaft (32) Stop, The circular sulcus (39) of the adjustment shaft (32) corresponding to the location of the upper bed peristome (38) of a bearing hole (31) is made to carry out fitting of the lock ring (40), migration in the lower part of an adjustment shaft (32) is prevented, and only a revolution assembles an adjustment shaft (32) possible in a bearing hole (31). As for the upper bed of an adjustment shaft (32), the slot (41) of a cross-joint form and (42) are prepared. The soffit of a spiral lever (11) is inserted in one slot (41), it connects with the hole (44) of a spiral lever, and the screw-thread hole (45) of an adjustment shaft (32) mutually through a set screw (43), and the pin (46) attached in the right angle is inserted in a spiral lever (11) in the slot on another side (42). Thereby, while an adjustment shaft (32) is hung by the spiral lever (11), a sliding object (16) is hung, a sliding object (16) supports a shoji (2) through a revolving shaft (24) and a connection arm (26), and the shoji (2) is lifted by the keeping member (7). The adjustment means of the torque of the torsion spring (15) of a keeping member (7) possesses the cam side (51) which forces on an adjustment shaft the lining puck (50) which gives damping force to the adjustment shaft other than the above-mentioned adjustment shaft (32), and this lining puck. The lining puck (50) stood up to the revolution ring (52) at one at four-piece regular intervals so that the surroundings of an adjustment shaft (32) might be surrounded, and the lever (53) is radially prolonged from this revolution ring. The cam side (51) is formed in four-piece regular intervals so that it may correspond to the inner skin of the amplification hole (31a) of a sliding object (16) at a lining puck (50). a cam side (51) and the outside surface (54) of the lining puck (50) in contact with this cam side are formed in the arc which goes to a hoop direction and to which it is alike, and it follows and a radius becomes large — having — intermediary \*\*\*\* with the die length of an outside (54) arc shorter than that of a cam side (51) — the intermediary splash also of the play can be carried out relatively. The inner surface (55) of a lining puck (50) is formed in the arc gestalt which can contact exactly the peripheral surface of the shank (34) of an adjustment shaft (32). Fitting of the lining puck (50) is carried out into the amplification hole (31a) surrounded in respect of the cam (51). Fitting of the shank (34) of an adjustment shaft (32) was carried out into the hole (56) surrounded by the lining puck (50), and the ring (52), and the lever (53) penetrated the aperture (57) formed in the rectangular parallelepiped part (17) of a sliding object (16), and has projected from the flat surface (22) to the method of outside. By a lever (53) being rockable between the ends (58) of an aperture (57), and (59), and a lever (53) dashing against the end (58) of an aperture (57), a lining puck (50) is in a neutral condition without the outside surface's (54)'s contacting a cam side (51), the inner surface (55) of a lining puck is not forced on an adjustment shaft (32) at the time of intermediary \*\*\*\*, but an adjustment shaft is in the condition of not braking. If it is made to rotate until it dashes a lever (53) in the direction of an arrow head (A) at the other end (59) of an aperture (57), the outside surface (54) is pushed in respect of a cam (51), and a lining puck (50) binds an adjustment shaft (32) tight inside (55), and will be in a braking condition. Fitting was carried out to the periphery of a lining puck (50), the end (61) was hooked on the lever (51), the other end (62) was hooked on the edge (58) of an aperture (57), and the volume spring (60) has always given the turning effort to the direction braked to a lining puck (50), and holds the braking condition of an adjustment shaft (32).

An adjustment shaft (32) has a slotted hole (graphic display abbreviation) in that soffit side, inserts the edge of a blade of a driver in this slotted hole, and rotates. If the torque of torsion spring (15) will increase if the damping force over this shaft is made in the condition of being canceled by actuation (an arrow head A and opposite direction) of a lever (53) and turns an adjustment shaft (32) counterclockwise, and a revolution of an adjustment shaft (32) turns clockwise, a torque will decrease. In addition, it is also made that rewinding [ of torsion spring

(15) ] cancels the damping force over an adjustment shaft (32). Thus, the torque of torsion spring (32) is adjusted so that it may balance with a shoji proper.

As a braking means to follow the tilting and to give damping force automatically to an aperture shoji, a lateral slot (65) is formed in the flat surface (22) of the rectangular parallelepiped part (17) of a sliding object (16), opening of the ends is carried out to the flat surface (19) of the both sides of a sliding object, and the amount of [ of a slot (65) ] center section is further open for free passage to the bearing hole (23). A braking member (66) is included in this slot (65), and a revolution of a revolving shaft (24) makes this braking member follow in a braking location. As a braking member (66) is shown in drawing 10, a rectangular parallelepiped part (67) and the braking part (68) of the \*\*\*\* right triangle which protruded on the both sides at one are provided. A rectangular parallelepiped part (67) has the arc side (69) which fits into a part for the tubed part of a sliding object (16) (18), the arc side (71) which fits into the flange (70) of a revolving shaft (24), and the cam abutment (72) of a water plane. A revolving shaft (24) has the flange (76) of the back end of the cam side (75) formed at the flat surface (74) which cut and lacked a periphery side (73) and its part in common, and a flat surface (74). the cam side (75) of a revolving shaft (24) -- the cam abutment (72) of a braking member (66) -- biting -- a revolution of \*\*\*\*\* and a revolving shaft (24) -- therefore, a braking member (66) is moved up and down. It bites at the tooth back of a cam abutment (72), and, as for the flange (76) of a revolving shaft (24), only the revolution holds the \*\*\*\*\* revolving shaft (24) possible. A braking part (68) has a braking side (78) vertical to a slanting sliding surface (77). It gears with the slideway (79) of the slant in the inner part of a slot (65), and the above-mentioned sliding surface (77) is extruded to the front, when it goes up, and when descending, it shows back a braking member (66) to it. the above-mentioned braking side (78) -- a braking member (66) -- a downward location -- \*\* -- it does not contact [ whether it consists in a way among one sliding surfaces (80) of the sliding slot (20) of a sliding object (16) at the time of intermediary \*\*\*\*, and the flange (21) of a door post (4) is contacted lightly, and ] at all. When a braking member (66) goes up, a braking side (78) is forced on the flange (21) of a door post (4), it gives damping force to a sliding object (16), and it is made to stop it. Damping force is held once in the horizontal position \*(ing) by this, when a shoji (2) is made to tilt to a horizontal position from a vertical position.

A locking means is formed in the top rail (82) and (82), and a shoji (1) and (2) prevent that a shoji rotates to the circumference of a revolving shaft (24) by locking of this means, and they permit a revolution of a shoji in release. The locking member (83) as this locking means possesses the helical compression spring (88) which energizes the locking rod (87) inserted possible [ sliding in the case (86) which consisted of a case body (84) and a base lid (85) which closes the effective area of that bottom, and this case ], and this locking rod (87) in the projection direction. A case body (84) and a base lid (85) are \*\*\*\*\*ed, it is combined by (89), and they are \*\*\*\*\*ed, and have fixed to the top rail (82) by (90). A locking rod (87) has a long hole (91), an impression (92), and a tongue (93). A long hole (91) \*\*\*\*\*s, surrounds (89) and (90), defines the stroke die length of frequent appearance of a locking rod (87), and a spring (88) is incorporated, the end of this spring gears on the wall surface of an impression (92), the other end blows an impression (92) to the bending piece (94) of a base lid (85), and it makes \*\*\*\*\* and a locking rod (87) project. The apical surface (95) of a locking rod (87) is formed in an arc, and this apical surface fits into a cylinder (9), and it moves up and down with a shoji (1) and (2) by making the cylinder into a slideway. This locking rod (87) is pinched by the flange (21) of the door post (4) of a sash, and (21), and prevents tilting of a shoji (1) and (2). The tongue (93) has projected upwards from the long hole (96) of a case body (84), and retreats a locking rod (87) in a lead-in location. By the retreat, a locking rod (87) moves outside from an engagement location with the flange (21) of the door post (4) of a sash, and enables tilting of a release condition, an intermediary, a shoji (1), and (2).

In addition, you may make it fixed [ which can perform neither vertical migration nor tilting ], and up-and-down medium is [ not a soffit but the upper bed of each shoji are sufficient as the center of rotation of a shoji (1) and (2), or ] sufficient as an outside shoji (1). It is also good to fall outside the others from which the hand of cut of a shoji also breaks down inside.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

A drawing shows the example of this invention. Drawing 1 the front view of an aperture, and the 2nd drawing 2 drawing The II-II line sectional view of drawing 1 , The III-III line sectional view of drawing 2 where the inside shoji could pull up drawing 3 in the lifting location, and the part was omitted, The IV-IV line sectional view of drawing 3 in which, as for drawing 4 , an inside shoji shows the condition of having been pushed down inside, drawing 5 and drawing 6 -- a sliding object, the adjustment means of torsion spring, and sliding -- the perspective view showing an assembly condition with the braking means of the body and its function -- The decomposition perspective view showing [ 7 ] the adjustment means for torsion spring in the VII-VII line sectional view of drawing 5 , and drawing 8 , drawing 9 -- the IX-IX line sectional view of drawing 7 , and drawing 10 -- sliding -- the XI-XI line sectional view of drawing 7 and drawing 12 of the decomposition perspective view showing the braking means of the body and its function and drawing 11 are XII-XII line sectional views of drawing 3 .

In (1) and (2), an aperture shoji and (3) among drawing a door post and (5) for a sash and (4) A guide rail, (6) and (7) are hung mutually. A member and (8) a cylinder and (10) for a connection pin and (9) A nut, In (11), a spiral lever and (15) a sliding object and (20) for torsion spring and (16) A sliding slot, In (21), a flange and (24) a connection arm and (27) for a revolving shaft and (26) A stile, In (28), a kicking rail and (32) a lining puck and (51) for an adjustment shaft and (50) A cam side, In (52), a revolution ring and (53) a volume spring and (66) for a lever and (60) A braking member, (72) -- a cam abutment and (75) -- a cam side and (77) -- a sliding surface and (78) -- a braking side and (79) -- for a locking member and (86), as for a locking rod and (88), a case and (87) are [ a slideway and (82) / a top rail and (83) / a helical compression spring and (93) ] tongues.

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[Translation done.]

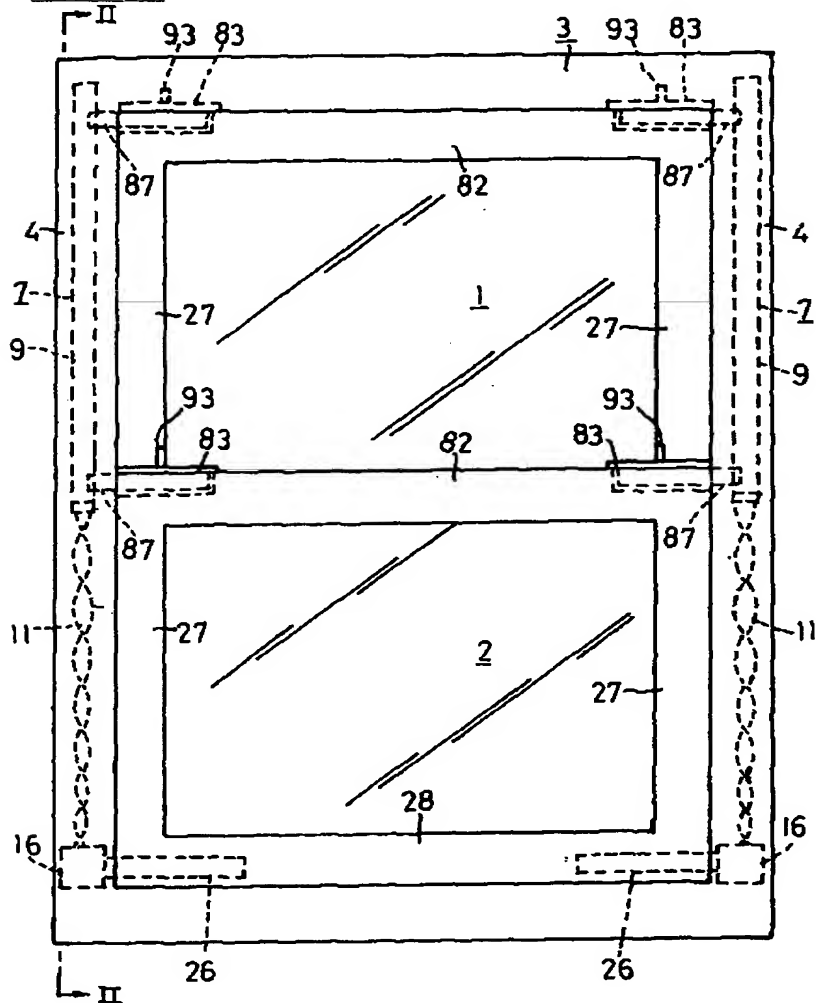
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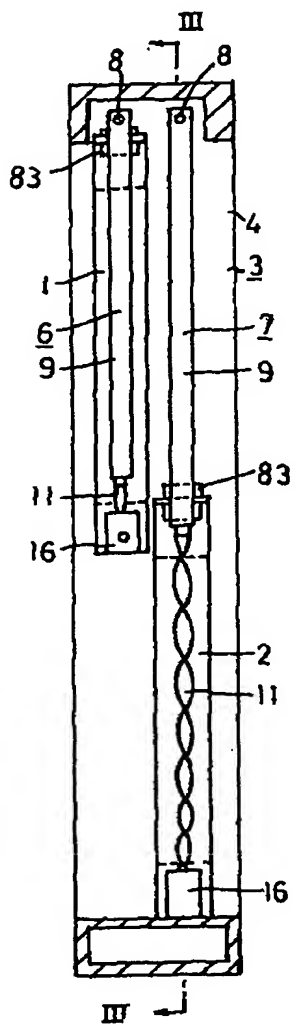
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## DRAWINGS

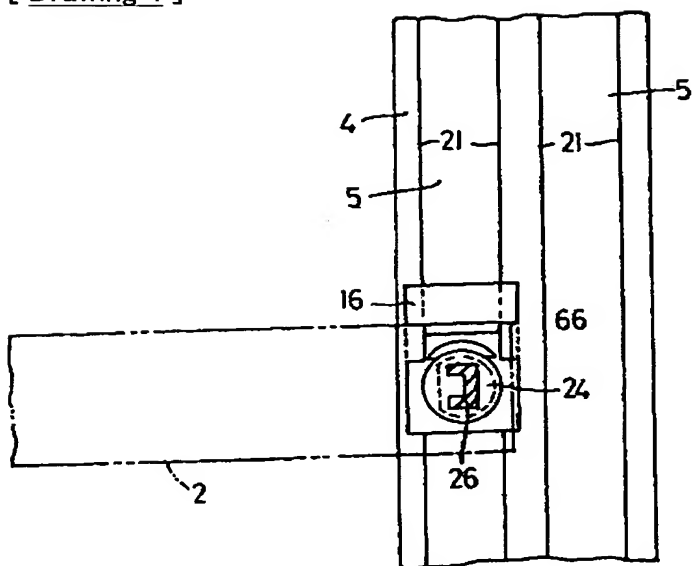
[ Drawing 1 ]



[ Drawing 2 ]

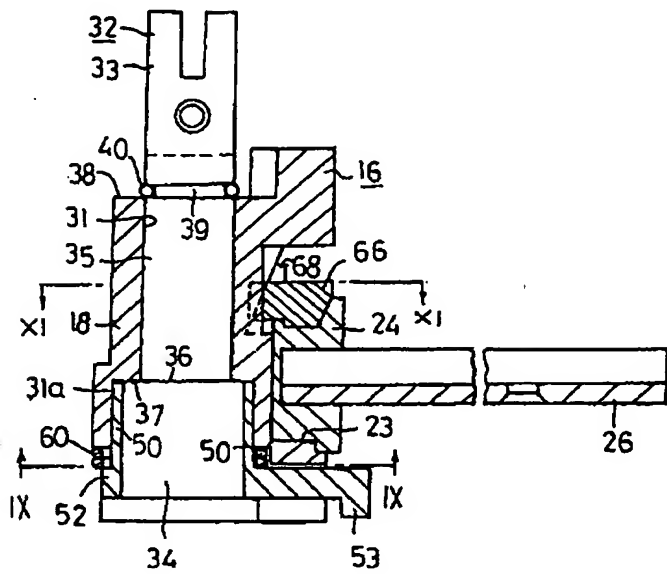


[ Drawing 4 ]

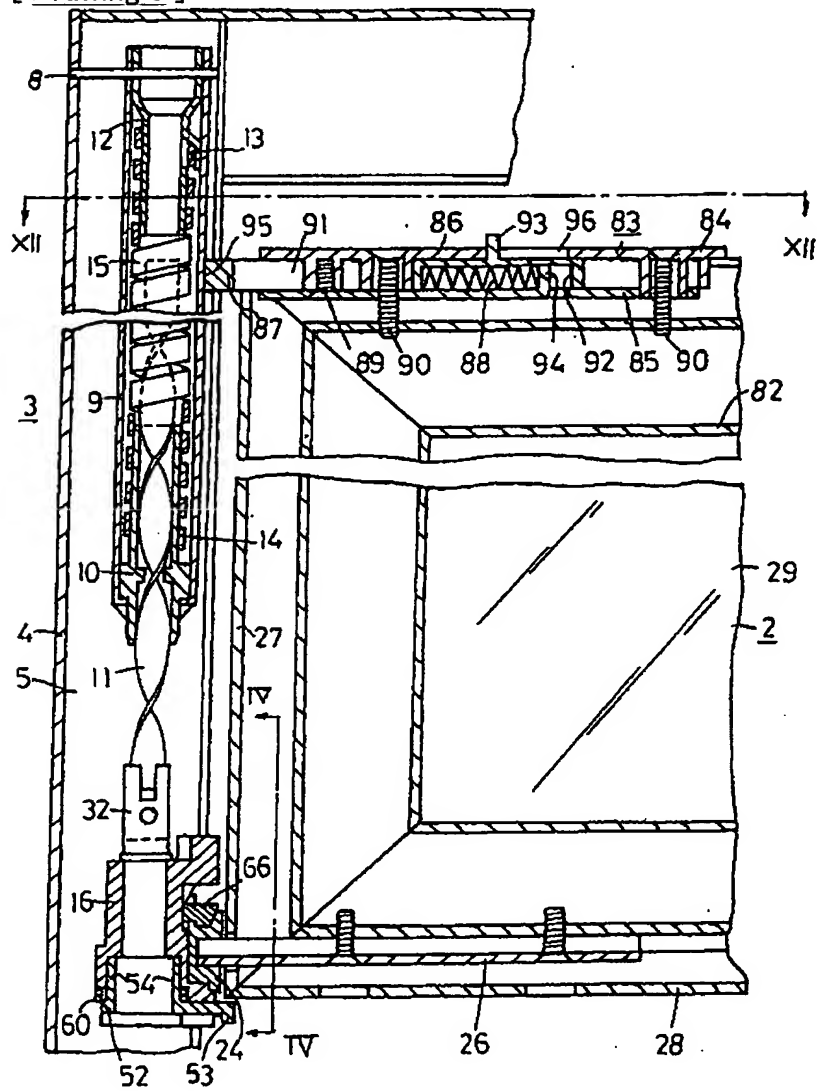


[ Drawing 7 ]

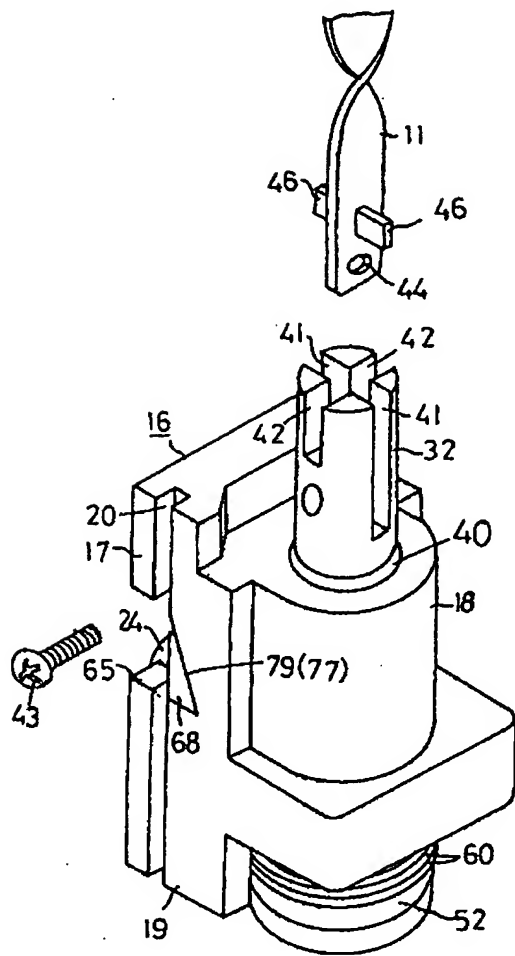




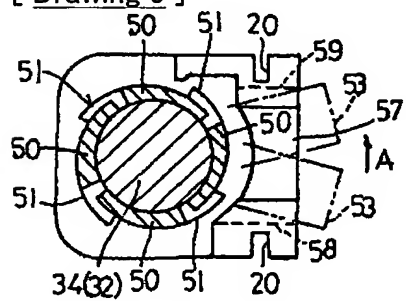
[ Drawing 3 ]



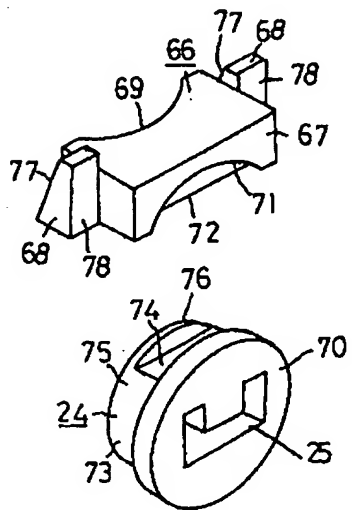
[ Drawing 6 ]



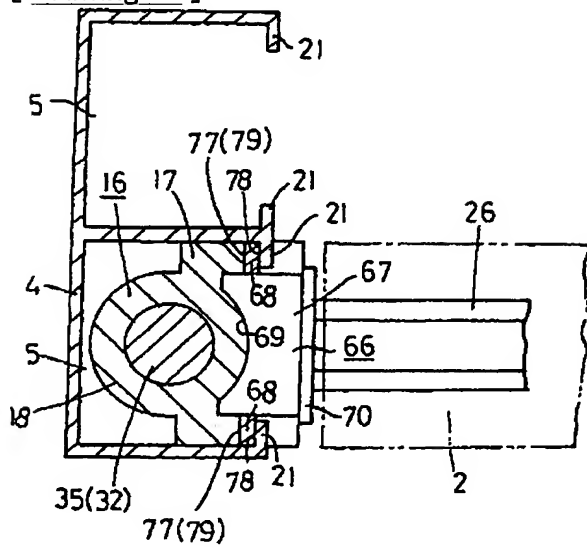
[ Drawing 9 ]



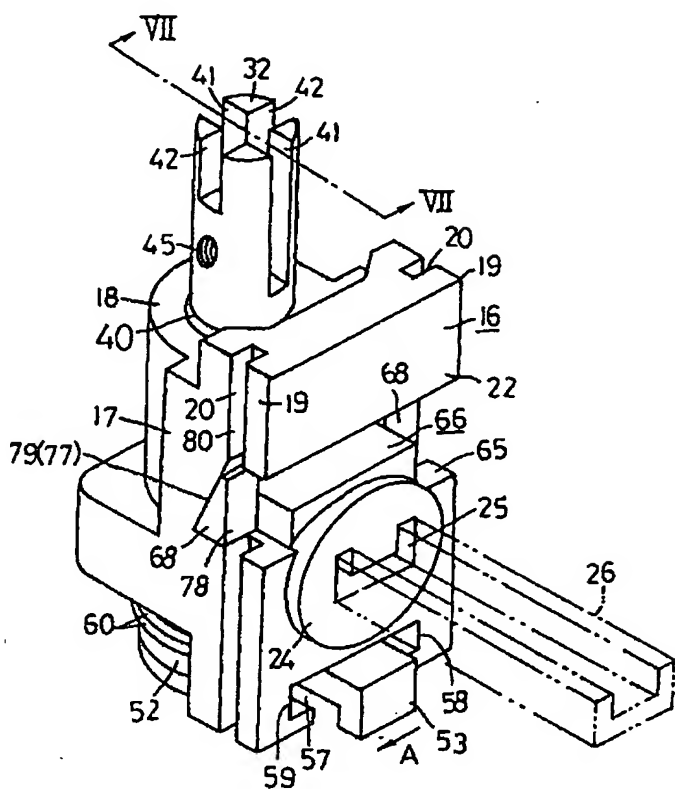
[ Drawing 10 ]



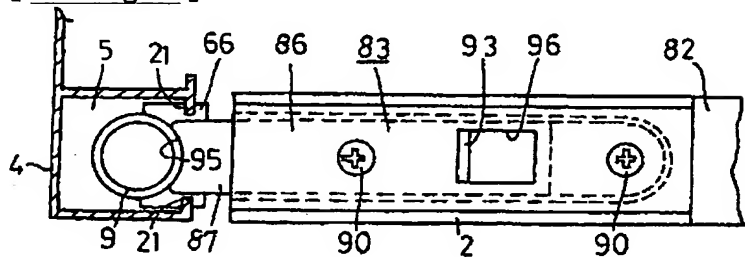
[ Drawing 11 ]



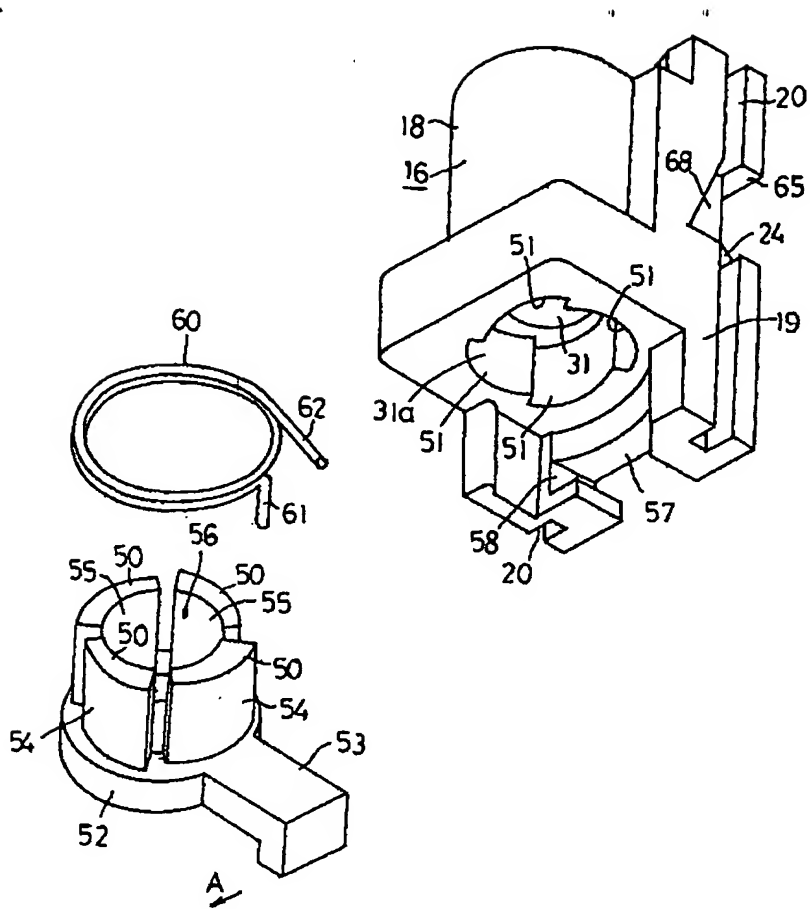
[ Drawing 5 ]



[ Drawing 12 ]



[ Drawing 8 ]



[Translation done.]

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⑭ 発明の名称 上下動窓の釣合装置

⑰ 特 願 平1-318880

⑱ 出 願 平1(1989)12月11日

⑲ 発 明 者 中 西 好 一 東京都千代田区神田和泉町1番地11

⑲ 発 明 者 松 原 健 吉 東京都千代田区神田佐久間町3丁目37番38号 中西産業株式会社内

⑲ 発 明 者 中 澤 保 東京都千代田区神田佐久間町3丁目37番38号 中西産業株式会社内

⑲ 出 願 人 株式会社中西エンジニアリング 東京都千代田区神田佐久間町3丁目37番38号

⑲ 代 理 人 弁理士 井上 清子 外1名

明 細 書

1 発明の名称 上下動窓の釣合装置

2 特許請求の範囲

1. 窓障子と釣り合つて該窓障子を任意の位置に静止させるねじりばねを有する釣合手段、該釣合手段に窓障子を連結し該窓障子を窓枠の縦枠に沿つて上下に案内する摺動体、該摺動体内に組み込まれてねじりばねの釣合力を調整する手段を具備し、上記調整手段はねじりばねをねじつて釣合力を調整する軸、該調整軸を制動して釣合力を保持する制動片、該制動片をその両方向の回転にて調整軸に制動のために押しつけたり調整軸から制動解除のために離したりさせるカム面を有する上下動窓の吊合い装置。

2. 前記調整軸は摺動体の縦孔内に回転可能に挿入され、前記カム面は上記縦孔の下部に形成され、前記制動片は調整軸とカム面との間に挿入されかつ調整軸に回転可能に嵌合された回転リングに起立され、該回転リングにそれを制動力解除方向に回転させるレバーが設けられ、さら

に回転リングを制動方向に常時付勢させるばねを含む請求項1記載の上下動窓の釣合装置。

3. 前記制動片は複数個に分割されたもので調整軸を囲むように構成され、前記カム面も分割された各制動片に対応するように複数個設けられた請求項2記載の上下動窓の釣合装置。

4. 前記摺動体の縦孔のカム面と、該カム面に接触する制動片の面は周方向に進むに従い半径が大きくなる弧状に形成された請求項3記載の上下動窓の釣合装置。

5. 前記釣合手段はさらに窓枠の縦枠に固定されかつ前記ねじりばねを囲みそのばねの上端と固着された筒と、該筒に回転のみ可能に連結されかつねじりばねの下端に固着されたナットと、ねじりばね内に上下動可能に挿入されて上記ナットと螺合しかつ調整軸に一体的回転可能に連結された螺線杆を具備し、該螺線杆はその下降時にナットを介してねじりばねを巻き締め、ねじりばねの巻き戻しにてナットを介して上昇される請求項4記載の上下動窓の釣合装置。

4 前記摺動体は窓障子が垂直方向に水平方向に回転された場合に該摺動体を自動的に制動させる制動手段が組み込まれた請求項5記載の上下動窓の釣合装置。

2 前記摺動体用の制動手段は上記摺動体に組み込まれると共に窓障子に連結される回転軸と、上記摺動体に組み込まれ窓障子が垂直方向から水平方向に傾動する際の回転軸の回転に追従して摺動体に制動力を与える制動部材を具備する請求項6記載の傾動可能な上下動窓の釣合装置。

8 前記回転軸はカム面を有し、前記制動部材は上記カム面を受けるカム受面を有し、回転軸の回転が制動部材を上下動させ、前記摺動体に斜めの案内面がまた上記制動部材に該案内面上を斜めに摺動する摺動面が各々設けられて上記制動部材をその上下動の際窓枠の縦枠に押しつけられる制動位置とその押しつけが解除される位置の間を横方向にも往復動させる請求項7記載の上下動窓の釣合装置。

9 窓障子の上框に設けられて該窓障子の傾動を

阻止する施錠手段を具備する請求項8記載の上下動窓の釣合装置。

10 前記施錠手段は、窓障子の上框に固定されるケースと、該ケース内に摺動可能に組み込まれる錠杆と、該錠杆を突出位置に付勢するばねを具備し、上記錠杆は前記釣合部材の筒を案内面として摺動可能に嵌合する面を有し、かつ窓枠の縦枠の案内溝にて挟まれて施錠状態となる請求項9記載の上下動窓の釣合装置。

### 3 発明の詳細な説明

#### 〔産業上の利用分野〕

本発明は上下動窓の釣合装置に関するものである。

#### 〔従来の技術〕

上下動窓の吊り合い装置において、ねじりばねのねじり力を窓障子との吊り合いに利用したものが知られていて、そのねじり力の調整に調整軸をラチェット機構で一方向に回転させるようにしたものや、調整軸にコイル状のブレーキばねの緊縛力による制動力を与えるようにしたものがある。

また上下動窓の窓障子を垂直方向から水平方向に回転させるものにおいて、窓障子用の釣合手段と該手段の釣合力の調整手段を具備する釣合装置と、上記釣合手段と窓障子の傾動の際該窓障子に制動力を与えてその位置に固定する制動手段を具備する釣合装置が知られている。

#### 〔発明が解決しようとする課題〕

上記従来の釣合装置において、ラチェット機構を利用したものはねじりばねの巻締めには便利であるが巻戻しができずねじり力を適正に調整できない。ブレーキばねを利用したものはねじりばねの巻締めと巻戻しのいずれもできるが、そのブレーキばねの制動力の不確実性やブレーキばねの弱化による制動力の減少にてねじりばねが自然に巻戻され、ひいては使用できなくなり、またねじりばねの巻締めや巻戻しの操作がブレーキばねのために軽快にできず重く、さらにはブレーキばねの組立が容易でない。

また窓障子が上下動のほかには前後に倒れるものにおいて、吊り合手段を具備するが制動手段を欠

いているものは、釣合手段と釣り合っている窓障子を傾動させるとその釣合がくずれて、吊合手段の引き上げ力が障子の引き下げ力より相対的に大きくなつて障子が上昇し、上記釣合手段と制動手段を具備するが調整手段を欠いているものは、また後者は調整手段を欠いているので、釣合手段と障子を窓枠内に組み立てた後の釣合手段の調整や使用による釣合手段の力の変化の調整ができない。このように従来の釣合装置はいずれのものにも問題があつた。

本発明は上下動の窓用の釣合手段の吊合力の調整が確実かつ容易でしかも軽快にでき、吊合力の保持も長い期間にわたつても確実になされ、さらには釣合手段の調整を窓障子と釣合手段が窓枠に組立られた状態にてもすることができると共に、窓障子を傾動させた場合に該障子に制動力が自動的に与えられて窓障子の釣合が保たれる便利な釣合装置を提供しようとするものである。

#### 〔課題を解決するための手段〕

本発明は上記目的を達成するために、窓障子と

吊り合うねじりばねを有する吊合手段と、該釣合手段に窓障子を連結して該窓障子を窓枠の縦枠に沿って上下に案内する摺動体と、該摺動体内に組み込まれてねじりばねの釣合力を調整する手段を具備し、上記調整手段はねじりばねの吊合力用の調整軸と、該調整軸用の制動片と、該制動片の動作のカム面を含んでいる。

本発明はさらに、窓障子の前方または後方への傾動に従って摺動体を自動的に制動する制動手段を具備している。

以下本発明の実施例につき図面を参照しながら具体的に説明する。

外側の窓障子(1)と内側の窓障子(2)は窓枠(3)の縦枠(4)の案内溝(5)、(5) (第1図)に沿って上下動し、外側窓障子は窓の上部を閉じ、下側窓障子は窓の下部を閉じる。各窓障子(1)、(2)は吊り合い手段として使用される釣合部材(6)、(7) (第2図)で釣合状態にて縦枠(4)に吊り下げられて任意の位置に静止される。

釣合部材(6)、(7)は内外の障子(1)、(2)に適合する

で上下させることができる。

摺動体(8)はほぼ直方体の部分(9)と該部分に一体に形成された筒状の部分(10)で主として構成されていて、窓枠の縦枠(4)の案内溝(5)内に摺動可能に組み込まれている。

直方体部分(9)はその両側の互いに平行な平面(11)に形成された上下方向の摺動溝(12)を有し、該摺動溝が縦枠(4)の案内溝(5)の開口面にのぞむフランジ(13) (第11図)に摺動可能に嵌合して摺動体(8)を案内溝(5)に沿って上下動させる。直方体部分(9)の両側平面(11)に直交する平面(14)はその下方に軸受孔(15) (第7図)を有し、該軸受孔内に回転軸(16)が回転自在に嵌合され、該回転軸の連結孔(17)に連結腕(18)を嵌合させて連結腕と回転軸を一体的に回転するように連結している。連結腕(18)は障子(2)の縦枠(4)の下端から下枠(19)にわたって組込んで固着され、障子を回転軸(16)を回転中心として室内側に垂直位置から水平位置まで傾動される。その傾動により、障子(2)のガラス(20)の外側面を室内側にて安全かつ容易に掃除することができる。

ように寸法が異なるのみで構造は同一であるので、内側障子(2)用のものについて主として説明する。他の部材についても同様である。

吊り合い部材(6)、(7)は上下方向に延びて上端が縦枠(4)にピン(8) (第2図、第3図)で連結される筒(9)と、該筒の下端に回転のみ可能に連結されたナット(10)と、上記筒内に上下動可能に挿入されてその下端がナット(10)を螺合状態にて貫通して筒(9)の下端から外方に突き出る螺線杆(11)と、上記筒(9)内にて螺線杆(11)に巻装されて筒(9)にばね止め部材(12)を介して固着された上端(13)とナット(10)に固着された下端(14)を有するねじりばね(15)を具備している。螺線杆(11)はその降下にてナット(10)を回転させてねじりばね(15)を巻き締め、ねじりばね(15)はその巻き戻しにてナット(10)を逆転させて螺線杆(11)を上昇させるように働く。螺線杆(11)を障子(1)、(2)に連結して、ねじりばね(15)に障子(1)、(2)とその最大上昇位置にて釣り合うねじり力を与えておくと、ねじりばね(15)は障子と常に吊り合つて障子を任意の位置に静止させることができ、しかも障子を小さな力

筒状部分(10)はその上下方向に貫通した軸受孔(16)と該軸受孔に連なる拡大孔(31a) (第7図)を有し、該軸受孔と拡大孔内にねじりばね(15)用の調整手段として使用される調整軸(17)が回転可能に挿入され、その上端の軸部(18)が筒状部分(10)から上方に突き出ると共に、下端の軸部(19)の一部が筒状部分(10)の下方に突き出ている。調整軸(17)は筒状部分(10)の軸受孔(16)に嵌合する軸部(18)からその上端の軸部(19)までは同一直径であり、軸受孔(16)から下方の軸部(19)は軸受孔(16)と軸部(19)より大きな直径に形成されている (第7図)。調整軸(17)を軸受孔(16)内に下方から挿入すると、軸部(19)、(19)間の段部(20)が軸受孔(16)と拡大孔(31a)間の段部(21)に突き当って調整軸(17)の上方への移動を止め、軸受孔(16)の上端口縁(22)の位置に対応する調整軸(17)の環状溝(23)に止輪(24)を嵌合させて調整軸(17)の下方への移動を阻止して、調整軸(17)を軸受孔(16)内に回転のみ可能に組立てる。調整軸(17)の上端は十字形の溝(25)、(25)が設けられ、一方の溝(25)には螺線杆(11)の下端が挿入されて、止ねじ(26)を螺線杆の孔(27)と調整軸(17)のねじ孔



49に通して互いに連結し、他方の溝49には螺線杆40に直角に取りつけられたピン46が挿入されてる。これにより調整軸42は螺線杆40に吊り下げられると共に摺動体48を吊り下げ、摺動体48が回転軸44と連結腕45を介して障子42を支え、障子42が釣合部材47にて吊り上げられている。

釣合部材47のねじりばね49のねじり力の調整手段は、上記調整軸42のほかにその調整軸に制動力を与える制動片43と、該制動片を調整軸に押しつけるカム面(51)を具備している。制動片43は調整軸42のまわりを囲むように4個等間隔に回転リング(52)に一体に起立され、該回転リングからレバー(53)が半径方向に延びている。カム面(51)は摺動体48の拡大孔(31a)の内周面に制動片43に対応するように4個等間隔に形成されている。カム面(51)と、該カム面に接触する制動片43の外面(54)は、周方向に進むに従い半径が大きくなる弧状に形成され、外面(54)の弧の長さがカム面(51)のそれより短くなつていて、相対的に遊びをもつて揺動できる。制動片43の内面(55)は調整軸42の

軸部44の周面にびつたり接触できるような弧状形態に形成されている。制動片43はカム面(51)で囲まれた拡大孔(31a)内に嵌合され、調整軸42の軸部44は制動片43で囲まれた孔(56)とリング(52)内に嵌合され、レバー(53)は摺動体48の直方体部分47に形成された窓(57)を貫通して平面44から外方に突き出ている。レバー(53)は窓(57)の両端(58)、(59)間にて揺動可能で、レバー(53)が窓(57)の一端(58)に突き当たっているときは、制動片43はその外面(54)がカム面(51)に接触しないで、中立状態にあり、制動片の内面(55)が調整軸42に押しつけられず、調整軸は非制動状態である。レバー(53)を矢印A方向に窓(57)の他端(59)に突き当たるまで回転させると、制動片43はその外面(54)がカム面(51)で押されて調整軸42を内面(55)にて緊縛し、制動状態となる。巻きばね(60)は制動片43の外周に嵌合されて、その一端(61)がレバー(51)に引掛けられ他端(62)が窓(57)の端部(58)に引掛けられて、制動片43に制動する方向への回転力を常時与えていて、調整軸42の制動状態を保持している。

調整軸42はその下端面に溝孔(図示略)を有し、この溝孔にドライバーの刃先を差し込んで回転される。調整軸42の回転は、該軸に対する制動力がレバー(57)の操作(矢印Aと反対方向)にて解除されている状態にてなされ、調整軸42を反時計方向にまわせばねじりばね49のねじり力が増大し、時計方向にまわせばねじり力が減少される。尚ねじりばね49の巻き戻しは調整軸42に対する制動力を解除するだけでもなされる。このようにしてねじりばね49のねじり力は障子と適正に釣り合うように調整される。

窓障子にその傾動に従って自動的に制動力を与える制動手段として、摺動体48の直方体部分47の平面44に横方向の溝(65)を形成し、その両端が摺動体の両側の平面49に開口され、さらに溝(65)の中央部分が軸受孔42に連通している。この溝(55)に制動部材(66)が組み込まれ、該制動部材を回転軸44の回転が制動位置に従動させる。制動部材(66)は第7図に示すように直方体部分(67)と、その両側に一体に突設されたほぼ直角三角形の制

動部分(68)を具備し、直方体部分(67)は摺動体48の筒状部分48に嵌合する弧状面(69)と、回転軸44のフランジ(70)に嵌合する弧状面(71)と、水平面状のカム受面(72)を有する。回転軸44は円周面(73)とその一部を平らに切り欠いた平面(74)で形成されたカム面(75)と、平面(74)の後端のフランジ(76)を有する。回転軸44のカム面(75)は制動部材(66)のカム受面(72)にかみ合つて、回転軸44の回転に従つて制動部材(66)を上下動させる。回転軸44のフランジ(76)はカム受面(72)の背面にかみ合つて回転軸44を回転のみ可能に保持している。制動部分(68)は斜めの摺動面(77)と垂直の制動面(78)を有する。上記摺動面(77)は溝(65)の奥の斜めの案内面(79)と噛み合い、制動部材(66)をそれが上昇するとき前方へ押し出し、下降するとき後方へ案内する。上記制動面(78)は制動部材(66)が下降位置をとっているとき摺動体48の摺動溝49の一方の摺動面(80)の内方に存して縦枠(4)のフランジ42に軽く接触するか全く接触しない。制動部材(66)が上昇すると、制動面(78)は縦枠(4)のフラン

シ如に押しつけられて、摺動体09に制動力を与えて停止させる。これにより、障子(2)を垂直位置から水平位置に傾動させた場合に障子に制動力がかかってその水平位置にて保持される。

障子(1)、(2)はその上框(82)、(82)に施錠手段が設けられ、該手段の施錠にて障子が回転軸04まわりに回転するのを阻止し、解錠にて障子の回転を許容する。この施錠手段としての施錠部材(83)はケース本体(84)とその底の開口面を閉じる底蓋(85)で構成されたケース(86)と、該ケース内に摺動可能に挿入された錠杆(87)と、該錠杆(87)を突出方向に付勢する圧縮コイルばね(88)を具備している。ケース本体(84)と底蓋(85)はねじ(89)で結合され、ねじ(90)で上框(82)に固着されている。錠杆(88)は長孔(91)とくぼみ(92)とつまみ(93)を有する。長孔(91)はねじ(89)、(90)をかこんで錠杆(88)の出没の行程長さを定め、くぼみ(92)はばね(88)が組み込まれ該ばねの一端がくぼみ(92)の壁面にかみ合い、他端が底蓋(85)の折り曲げ片(94)にかみ合つて、錠杆(87)を突出させる。錠杆

(87)の先端面(95)は弧状に形成され、該先端面が筒(9)に嵌合してその筒を案内面として障子(1)、(2)と共に上下動する。この錠杆(87)は窓枠の縦枠(4)のフランジ02、02で挟まれて、障子(1)、(2)の傾動を阻止する。つまみ(93)はケース本体(84)の長孔(96)から上方へ突き出ている、錠杆(87)を引込位置に後退させる。その後退にて、錠杆(87)は窓枠の縦枠(4)のフランジ02とのかみ合い位置から外側に移動し、解錠状態となつて、障子(1)、(2)の傾動を可能にさせる。

尚外側の障子(1)は上下移動も傾動もできない固定式にしてもよく、障子(1)、(2)の回転中心は各障子の下端でなく上端でもよく、あるいは上下の間でもよい。障子の回転方向も内倒れの他に外倒れでもよい。

#### 〔発明の効果〕

本発明は窓障子と吊り合うねじりばね03のねじり力を調整する手段として、ねじりばねを回転させる調整軸02に制動片04をカム面(51)で押しつけて制動力を与えたり、その制動片の押しつけをカ

ム面で解除可能にして、調整軸に対する制動を解除させるように構成されているので、上下動の窓用の釣合手段の吊合力の調整が確実かつ容易でしかも軽快にでき、吊合力の保持も長期にわたつても確実になされる。本発明はさらに窓障子の前方または後方への傾動に従つて吊合手段に窓障子を連結する摺動体09を自動的に制動する制動手段を具備しているので、窓障子の釣合が垂直面と水平面のいずれの面にても保たれて便利である。

#### 図面の簡単な説明

図面は本発明の実施例を示し、第1図は窓の正面図、第2図は第1図のⅡ-Ⅱ線断面図、第3図は内側障子が上昇位置に引き上げられて一部が省略された第2図のⅡ-Ⅱ線断面図、第4図は内側障子が内側に倒された状態を示す第3図のⅡ-Ⅱ線断面図、第5図と第6図は摺動体とねじりばねの調整手段と摺動体用の制動手段との組立状態を示す斜視図、第7図は第5図のⅣ-Ⅳ線断面図、第8図はねじりばね用の調整手段を示す分解斜視図、第9図は第7図のⅤ-Ⅴ線断面図、第10図

は摺動体用の制動手段を示す分解斜視図、第11図は第7図のⅥ-Ⅵ線断面図、第12図は第3図のⅦ-Ⅶ線断面図である。

図中(1)と(2)は窓障子、(3)は窓枠、(4)は縦枠、(5)は案内溝、(6)と(7)は吊り合い部材、(8)は連結ピン、(9)は筒、00はナット、01は螺線杆、02はねじりばね、03は摺動体、04は摺動溝、05はフランジ、06は回転軸、07は連結腕、08は縦框、09は下框、10は調整軸、11は制動片、(51)はカム面、(52)は回転リング、(53)はレバー、(60)は巻きばね、(86)は制動部材、(72)はカム受面、(75)はカム面、(77)は摺動面、(78)は制動面、(79)は案内面、(82)は上框、(83)は施錠部材、(86)はケース、(87)は錠杆、(88)は圧縮コイルばね、(93)はつまみである。

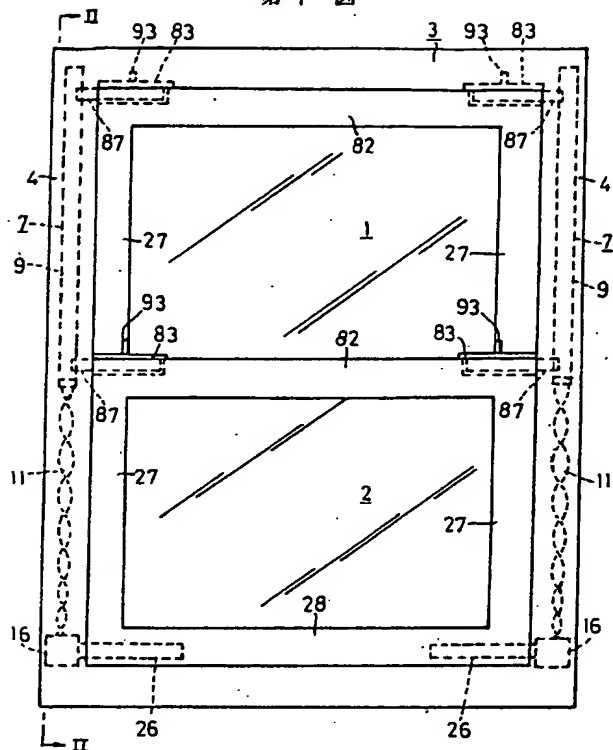
特許出願人 株式会社中西エンジニアリング

代理人 弁理士 井 上 清 子

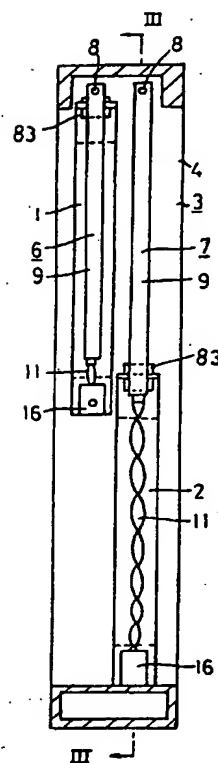
代理人 弁理士 亀 川 義 示



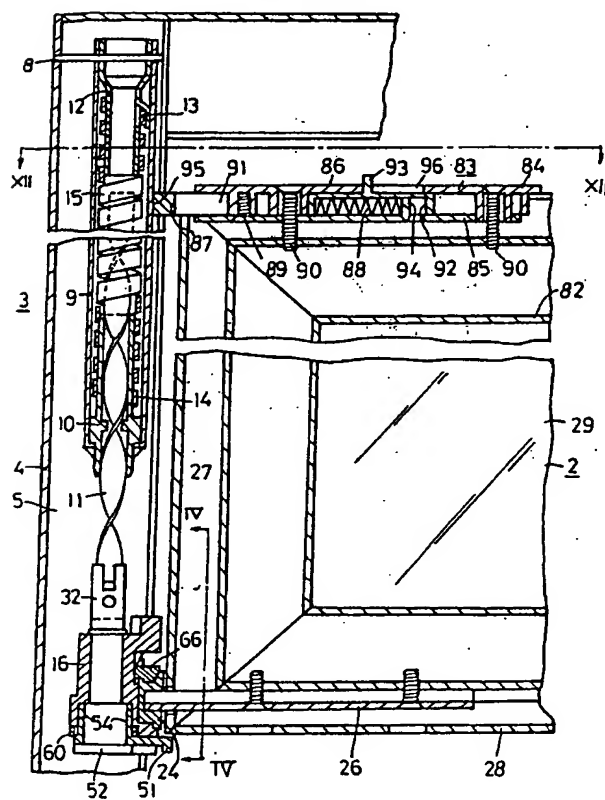
第 1 図



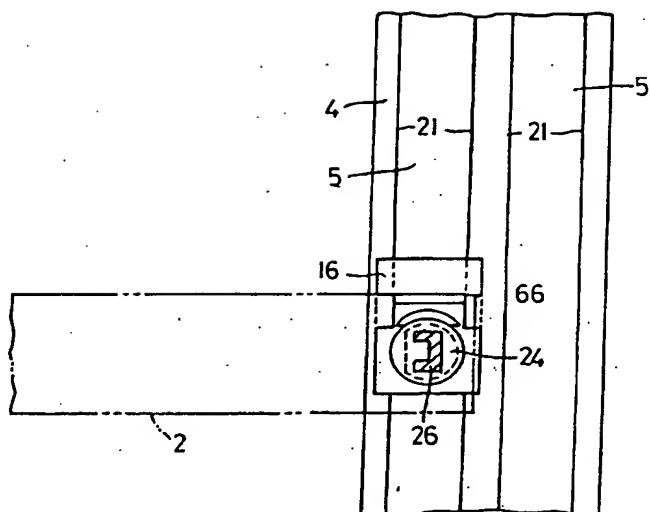
第 2 図



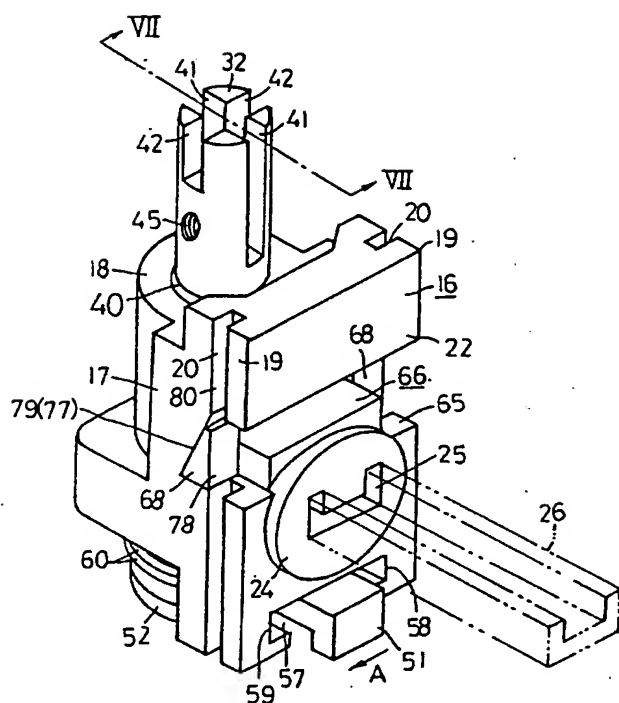
第 3 図



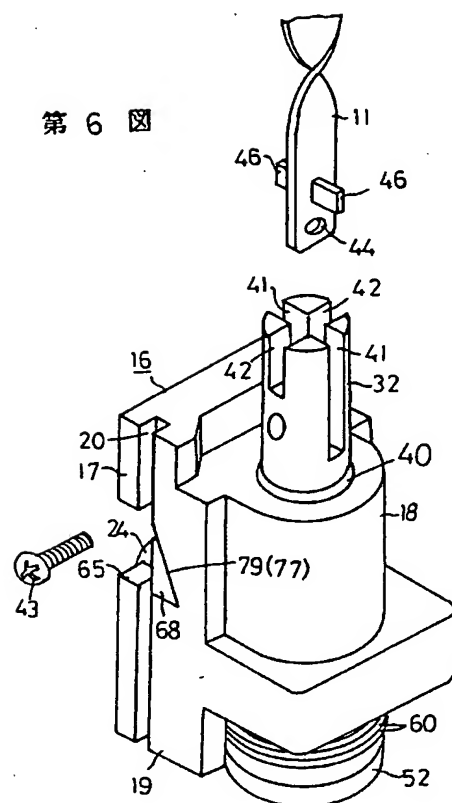
第 4 図



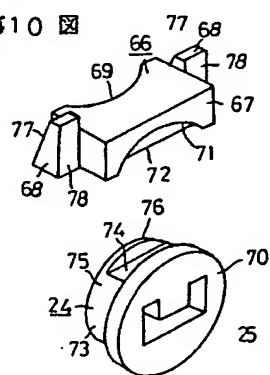
第 5 図



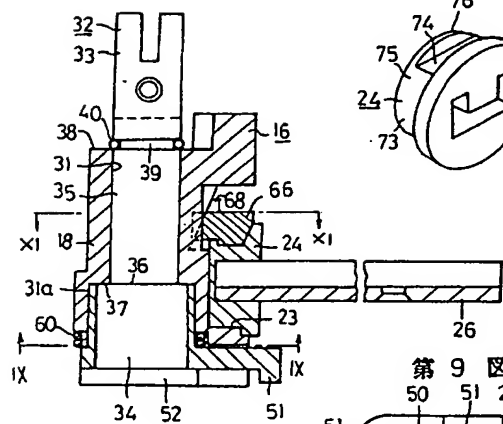
第 6 図



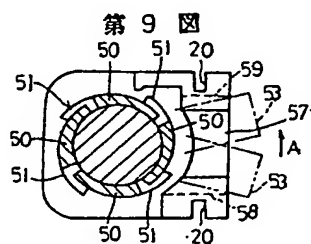
第 10 図



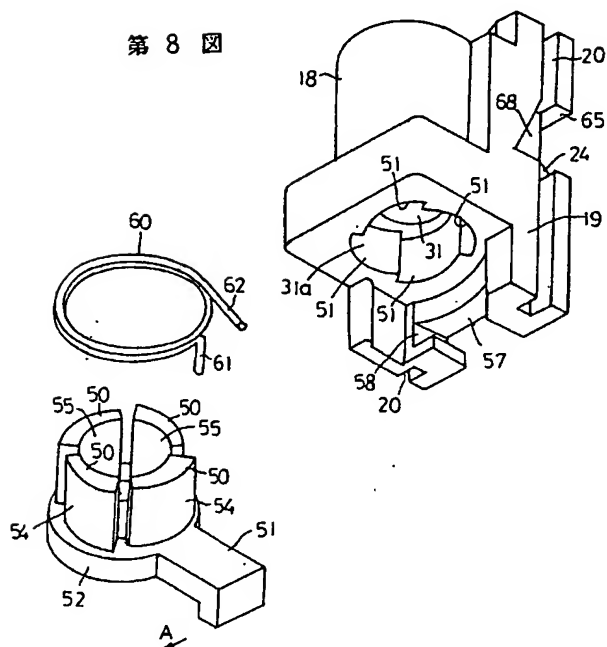
第 7 図



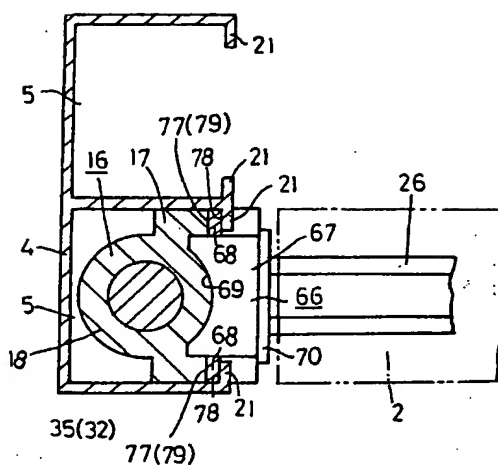
第 9 図



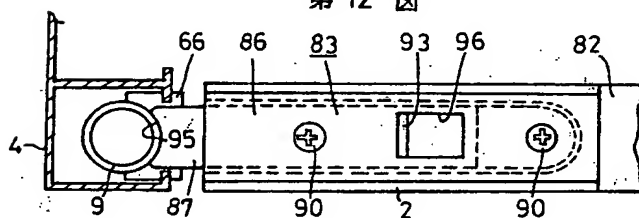
第 8 図



第 11 図



第 12 図



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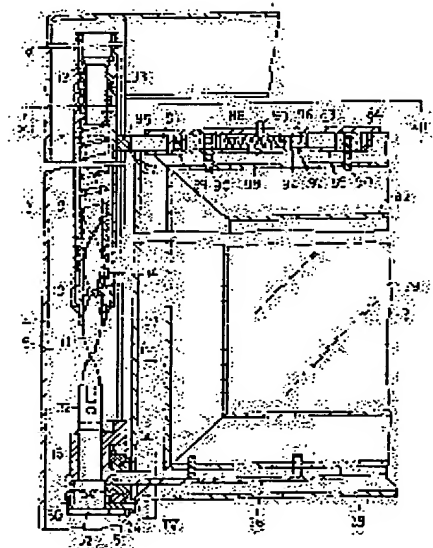
(72)Inventor : NAKANISHI KOICHI  
MATSUBARA KENKICHI  
NAKAZAWA TAMOTSU

## (54) BALANCING DEVICE FOR VERTICAL MOTION WINDOW

### (57)Abstract:

**PURPOSE:** To facilitate regulation of a balancing force by a method wherein a regulating means comprising a regulating shaft for a balancing force, a brake piece for the regulating shaft, and a cam surface for operation of the brake piece is mounted in a slide body through which a window screen is coupled to a balancing means.

**CONSTITUTION:** A helical lever 11 of a balancing member is coupled to an outer window screen and an inner window screen 2, and torque balanced with the two screens in the maximum rising position is exerted on a torsion spring 15. When the torque of the torsion spring 15 is regulated, a brake piece 50 integrally erecting on a rotary ring 52 is pressed against a regulating shaft 32 by means of a cam surface 51 formed on the inner peripheral surface of the enlarge hole of a slide body 16 to exert a brake force for regulation. Press of the brake piece 50 can be released by means of the cam surface 51 and a brake on the regulating shaft 32 is released for regulation.



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(71) 出願人 999999999  
株式会社中西エンジニアリング  
東京都千代田区神田佐久間町3丁目37番38号  
(72) 発明者 中西 好一  
東京都千代田区神田和泉町1番地11  
(72) 発明者 松原 健吉  
東京都千代田区神田佐久間町3丁目37番38号 中西産業株式会社内  
(72) 発明者 中澤 保  
東京都千代田区神田佐久間町3丁目37番38号 中西産業株式会社内  
(74) 代理人 弁理士 井上 清子 (外1名)

審査官 木原 裕

(56) 参考文献 実開 昭63-8367 (J P, U)  
実開 昭57-58666 (J P, U)

(54) 【発明の名称】 上下動窓の釣合装置

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【特許請求の範囲】

【請求項1】窓障子と釣り合って該窓障子を任意の位置に静止させるねじりばねを有する釣合手段と、該釣合手段に窓障子を連結し該窓障子を窓枠の縦枠に沿って上下に案内する摺動体と、該摺動体内に組み込まれてねじりばねの釣合力を調整する手段を具備し、上記調整手段は、ねじりばねをねじって調整する軸と、該調整軸を制動して釣合力を保持する制動片と、該制動片をその両方向の回転にて調整軸に制動のために押しつけたり調整軸から制動解除のために離したりさせるカム面を有し、上記調整軸は摺動体の縦孔内に回転可能に挿入され、上記カム面は上記縦孔の下部に形成され、上記制動片は調整軸とカム面との間に挿入されかつ調整軸に回転可能に嵌合された回転リングに起立され、該回転リングにそれを制動力解除方向に回転させるレバーが設けられ、さらに

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上記調整手段は回転リングを制動方向に常時付勢させるばねを有する上下動窓の釣合装置。

【請求項2】前記制動片は複数個に分割されたもので調整軸を囲むように構成され、前記カム面も分割された各制動片に対応するように複数設けられた請求項1記載の上下動窓の釣合装置。

【請求項3】前記摺動体の縦孔のカム面と、該カム面に接触する制動片の面は周方向に進むに従い半径が大きくなる弧状に形成された請求項2記載の上下動窓の釣合装置。

【請求項4】前記釣合手段はさらに窓枠の縦枠に固定されかつ前記ねじりばねを囲みそのばねの上端と固着された筒と、該筒に回転のみ可能に連結されかつねじりばねの下端に固着されたナットと、ねじりばね内に上下動可能に挿入されて上記ナットと螺合しかつ調整軸に一体的

に回転可能に連結された螺旋杆を具備し、該螺旋杆はその下降時にナットを介してねじりばねを巻き締め、ねじりばねの巻き戻しにてナットを介して上昇させる請求項3記載の上下動窓の釣合装置。

【請求項5】前記摺動体は、窓障子が垂直方向から水平方向に回転された場合に該摺動体を自動的に制動させる制動手段が組み込まれた請求項4記載の上下動窓の釣合装置。

【請求項6】前記摺動体用の制動手段は上記摺動体に組み込まれると共に窓障子に連結される回転軸と、上記摺動体に組み込まれ窓障子が垂直方向から水平方向に傾動する際の回転軸の回転に追従して摺動体に制動力を与える制動部材を具備する請求項5記載の上下動窓の釣合装置。

【請求項7】前記回転軸はカム面を有し、前記制動部材は上記カム面を受けるカム受面を有し、回転軸の回転が制動部材を上下動させ、前記摺動体に斜めの案内面がまた上記制動部材に該案内面上を斜めに摺動する摺動面が各々設けられて上記制動部材をその上下動の際窓枠の縦枠に押しつけられる制動位置とその押しつけが解除される位置の間を横方向にも往復動させる請求項6記載の上下動窓の釣合装置。

【請求項8】窓障子の上框に設けられて該窓障子の傾動を阻止する施錠手段を具備する請求項7記載の上下動窓の釣合装置。

【請求項9】前記施錠手段は、窓障子の上框に固定されるケースと、該ケース内に摺動可能に組み込まれる錠杆と、該錠杆を突出位置に付勢するばねを具備し、上記錠杆は前記釣合部材の筒を案内面として摺動可能に嵌合する面を有し、かつ窓枠の縦枠の案内溝にて挟まれて施錠状態となる請求項8記載の上下動窓の釣合装置。

【発明の詳細な説明】

【産業上の利用分野】

本発明は上下動窓の釣合装置に関するものである。

【従来の技術】

上下動窓の吊り合い装置において、ねじりばねのねじり力を窓障子との吊り合いに利用したものが知られていて、そのねじり力の調整に調整軸をラチェット機構で一方に回転させるようにしたものや、調整軸にコイル状のブレーキばねの緊縛力による制動力を与えるようにしたものがある。

また上下動窓の窓障子を垂直方向から水平方向に回転させるものにおいて、窓障子用の釣合手段と該手段の釣合力の調整手段を具備する釣合装置と、上記釣合手段と窓障子の傾動の際該窓障子に制動力を与えてその位置に固定する制動手段を具備する釣合装置が知られている。

【発明が解決しようとする課題】

上記従来の釣合装置において、ラチェット機構を利用したものはねじりばねの巻締めには便利であるが巻戻しができずねじり力を適正に調整できない。ブレーキばねを

利用したものはねじりばねの巻締めと巻戻しのいずれもできるが、そのブレーキばねの制動力の不確実性やブレーキばねの弱化による制動力の減少にてねじりばねが自然に巻戻され、ひいては使用できなくなり、またねじりばねの巻締めや巻戻しの操作がブレーキばねのために軽快にできず重く、さらにはブレーキばねの組立が容易でない。

また窓障子が上下動のほか前後に倒れるものにおいて、吊り合手段を具備するが制動手段を欠いているものは、釣合手段と釣り合っている窓障子を傾動させるとその釣合がくずれて、吊合手段の引き上げ力が障子の引き下げ力より相対的に大きくなつて障子が上昇し、上記釣合手段と制動手段を具備するが調整手段を欠いているものは、また後者は調整手段を欠いているので、釣合手段と障子を窓枠内に組み立てた後の釣合手段の調整や使用による釣合手段の力の変化の調整ができない。このように従来の釣合装置はいずれのものにも問題があつた。

本発明は上下動の窓用の釣合手段の吊合力の調整が確実かつ容易でしかも軽快にでき、吊合力の保持も長い期間にわたつても確実になされ、さらには釣合手段の調整を窓障子と釣合手段が窓枠に組立られた状態にてもすることができると共に、窓障子を傾動させた場合に該障子に制動力が自動的に与えられて窓障子の釣合が保たれる便利な釣合装置を提供しようとするものである。

【課題を解決するための手段】

本発明は上記目的を達成するために、窓障子と吊り合うねじりばねを有する吊合手段と、該釣合手段に窓障子を連結して該窓障子を窓枠の縦枠に沿つて上下に案内する摺動体と、該摺動体内に組み込まれてねじりばねの釣合力を調整する手段を具備し、上記調整手段はねじりばねの吊合力用の調整軸と、該調整軸用の制動片と、該制動片の動作用のカム面を含んでいる。

本発明はさらに、窓障子の前方または後方への傾動に従つて摺動体を自動的に制動する制動手段を具備している。

以下本発明の実施例につき図面を参照しながら具体的に説明する。

外側の窓障子(1)と内側の窓障子(2)は窓枠(3)の縦枠(4)の案内溝(5)、(5)(第4図)に沿つて上下動し外側窓障子は窓の上部を閉じ、下側窓障子は窓の下部を閉じる。各窓障子(1)、(2)は吊り合い手段として使用される釣合部材(6)、(7)(第2図)で釣合状態にて縦枠(4)に吊り下げられて任意の位置に静止される。

釣合部材(6)、(7)は内外の障子(1)、(2)に適合するように寸法が異なるのみで構造は同一であるので、内側障子(2)用のものについて主として説明する。他の部材についても同様である。

吊り合い部材(6)、(7)は上下方向に延びて上端が縦枠(4)にピン(8)(第2図、第3図)で連結される筒(9)と、該筒と下端に回転のみ可能に連結されたナット(10)

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と、上記筒内に上下動可能に挿入されてその下端がナット(10)を螺合状態にて貫通して筒(9)の下端から外方に突き出る螺旋杆(11)と、上記筒(9)内にて螺旋杆(11)に巻装されて筒(9)にはね止め部材(12)を介して固着された上端(13)とナット(10)に固着された下端(14)を有するねじりばね(15)を具備している。螺旋杆(11)はその降下にてナット(10)を回転させてねじりばね(15)を巻き締め、ねじりばね(15)はその巻き戻しにてナット(10)を逆転させて螺旋杆(11)を上昇させるように働く。螺旋杆(11)を障子(1)、(2)に連結して、ねじりばね(15)に障子(1)、(2)とその最大上昇位置にて釣り合うねじり力を与えておくと、ねじりばね(15)は障子と常に吊り合つて障子を任意の位置に静止させることができ、しかも障子を小さな力で上下させることができる。

摺動体(16)は、直方体の部分(17)と該部分に一体に形成された筒状の部分(18)で主として構成されていて、窓枠の縦枠(4)の案内溝(5)内に摺動可能に組み込まれている。

直方体部分(17)はその両側の互いに平行な平面(19)に形成された上下方向の摺動溝(20)を有し、該摺動溝が縦枠(4)の案内溝(5)の開口面にのぞむフランジ(21)(第11図)に摺動可能に嵌合して摺動体(16)を案内溝(5)に沿つて上下動させる。直方体部分(17)の両側平面(19)に直交する平面(22)はその下方に軸受孔(23)(第7図)を有し、該軸受孔内に回転軸(24)が回転自在に嵌合され、該回転軸の連結孔(25)に連結腕(26)を嵌合させて連結腕と回転軸を一体的に回転するように連結している。連結腕(26)は障子(2)の縦枠(27)の下端から下枠(28)にわたつて組込んで固着され、障子を回転軸(24)を回転中心として室内側に垂直位置から水平位置まで傾動される。その傾動により障子(2)のガラス(29)の外側面を室内側にて安全かつ容易に掃除することができる。

筒状部分(18)はその上下方向に貫通した軸受孔(31)と該軸受孔に連なる拡大孔(31a)(第7図)を有し、該軸受孔と拡大孔内にねじりばね(15)用の調整手段として使用される調整軸(32)が回転可能に挿入され、その上端の軸部(33)が筒状部分(18)から上方に突き出ると共に、下端の軸部(34)の一部が筒状部分(18)の下方に突き出ている。調整軸(32)は筒状部分(18)の軸受孔(31)に嵌合する軸部(35)からその上端の軸部(33)までは同一直径であり、軸受孔(31)から下方の軸部(34)は軸受孔(31)と軸部(35)より大きな直径に形成されている(第7図)。調整軸(32)を軸受孔(31)内に下方から挿入すると、軸部(34)、(35)間の段部(36)が軸受孔(31)と拡大孔(31a)間の段部(37)に突き当たつて調整軸(32)の上方への移動を止め、軸受孔(31)の上端口縁(38)の位置に対応する調整軸(32)の環状溝(39)に止輪(40)を嵌合させて調整軸(32)の下方への移動を阻止して、調整軸(32)を軸受孔(31)内に回転のみ可能に組立てる。調整軸(32)の上端は十字形の溝(41)、(42)が設けられ、一方の溝(41)には螺旋杆

(11)の下端が挿入されて、止ねじ(43)を螺旋杆の孔(44)と調整軸(32)のねじ孔(45)に通して互いに連結し、他方の溝(42)には螺旋杆(11)に直角に取りつけられたピン(46)が挿入されてる。これにより調整軸(32)は螺旋杆(11)に吊り下げられると共に摺動体(16)を吊り下げ、摺動体(16)が回転軸(24)と連結腕(26)を介して障子(2)を支え、障子(2)が釣合部材(7)にて吊り上げられている。釣合部材(7)のねじりばね(15)のねじり力の調整手段は、上記調整軸(32)のほかにその調整軸に制動力を与える制動片(50)と、該制動片を調整軸に押しつけるカム面(51)を具備している。制動片(50)は調整軸(32)のまわりを囲むように4個等間隔に回転リング(52)に一体に起立され、該回転リングからレバー(53)が半径方向に延びている。カム面(51)は摺動体(16)の拡大孔(31a)の内周面に制動片(50)に対応するように4個等間隔に形成されている。カム面(51)と、該カム面に接触する制動片(50)の外表面(54)は、周方向に進むに従い半径が大きくなる弧状に形成され、外表面(54)の弧の長さがカム面(51)のそれより短くなつていて、相対的に遊びをもつて揺動できる。制動片(50)の内面(55)は調整軸(32)の軸部(34)の周面にびつたり接触できるような弧状形態に形成されている。制動片(50)はカム面(51)で囲まれた拡大孔(31a)内に嵌合され、調整軸(32)の軸部(34)は制動片(50)で囲まれた孔(56)とリング(52)内に嵌合され、レバー(53)は摺動体(16)の直方体部分(17)に形成された窓(57)を貫通して平面(22)から外方に突き出ている。レバー(53)は窓(57)の両端(58)、(59)間にて揺動可能で、レバー(53)が窓(57)の一端(58)に突き当たっているときは、制動片(50)はその外表面(54)がカム面(51)に接触しないで、中立状態にあり、制動片の内面(55)が調整軸(32)に押しつけられず、調整軸は非制動状態である。レバー(53)を矢印(A)方向に窓(57)の他端(59)に突き当たるまで回転させると、制動片(50)はその外表面(54)がカム面(51)で押されて調整軸(32)を内面(55)にて緊縛し、制動状態となる。巻きばね(60)は制動片(50)の外周に嵌合されて、その一端(61)がレバー(53)に引掛けられ他端(62)が窓(57)の端部(58)に引掛けられて、制動片(50)に制動する方向への回転力を常時与えていて、調整軸(32)の制動状態を保持している。

調整軸(32)はその下端面に溝孔(図示略)を有し、この溝孔にドライバーの刃先を差し込んで回転される。調整軸(32)の回転は、該軸に対する制動力がレバー(53)の操作(矢印Aと反対方向)にて解除されている状態になされ、調整軸(32)を反時計方向にまわせばねじりばね(15)のねじり力が増大し、時計方向にまわせばねじり力が減少される。尚ねじりばね(15)の巻き戻しは調整軸(32)に対する制動力を解除するだけでもなされる。このようにしてねじりばね(15)のねじり力は障子と適正に釣り合うように調整される。

窓障子にその傾動に追従して自動的に制動力を与える制動手段として、摺動体(16)の直方体部分(17)の平面(22)に横方向の溝(65)を形成し、その両端が摺動体の両側の平面(19)に開口され、さらに溝(65)の中央部分が軸受孔(23)に連通している。この溝(65)に制動部材(66)が組み込まれ、該制動部材を回転軸(24)の回転が制動位置に従動させる。制動部材(66)は第10図に示すように直方体部分(67)と、その両側に一体に突設された直角三角形の制動部分(68)を具備し、直方体部分(67)は摺動体(16)の筒状部分(18)に嵌合する弧状面(69)と、回転軸(24)のフランジ(70)に嵌合する弧状面(71)と、水平面状のカム受面(72)を有する。回転軸(24)は円周面(73)とその一部を平らに切り欠いた平面(74)で形成されたカム面(75)と、平面(74)の後端のフランジ(76)を有する。回転軸(24)のカム面(75)は制動部材(66)のカム受面(72)にかみ合つて、回転軸(24)の回転に従つて制動部材(66)を上下動させる。回転軸(24)のフランジ(76)はカム受面(72)の背面にかみ合つて回転軸(24)を回転のみ可能に保持している。制動部分(68)は斜めの摺動面(77)と垂直の制動面(78)を有する。上記摺動面(77)は溝(65)の奥の斜めの案内面(79)と噛み合い、制動部材(66)をそれが上昇するとき前方へ押し出し、下降するとき後方へ案内する。上記制動面(78)は制動部材(66)が下降位置をとつてるとき摺動体(16)の摺動溝(20)の一方の摺動面(80)の内方に存して縦棒(4)のフランジ(21)に軽く接触するか全く接触しない。制動部材(66)が上昇すると、制動面(78)は縦棒(4)のフランジ(21)に押しつけられて、摺動体(16)に制動力を与えて停止させる。これにより、障子(2)を垂直位置から水平位置に傾動させた場合に障子に制動力がかかつてその水平位置にて保持される。

障子(1)、(2)はその上框(82)、(82)に施錠手段が設けられ、該手段の施錠にて障子が回転軸(24)まわりに回転するのを阻止し、解錠にて障子の回転を許容する。この施錠手段としての施錠部材(83)はケース本体(84)とその底の開口面を閉じる底蓋(85)で構成されたケース(86)と、該ケース内に摺動可能に挿入された錠杆(87)と、該錠杆(87)を突出方向に付勢する圧縮コイルばね(88)を具備している。ケース本体(84)と底蓋(85)はねじ(89)で結合され、ねじ(90)で上框(82)に固着されている。錠杆(87)は長孔(91)とくぼみ(92)とつまみ(93)を有する。長孔(91)はねじ(89)、(90)をかこんで錠杆(87)の出没の行程長さを定め、くぼみ(92)はばね(88)が組み込まれ該ばねの一端がくぼみ(92)の壁面にかみ合い、他端が底蓋(85)の折り曲げ片(94)にかみ合つて、錠杆(87)を突出させる。錠杆(87)の先端面(95)は弧状に形成され、該先端面が筒(9)に嵌合してその筒を案内面として障子(1)、(2)と共に上下動する。この錠杆(87)は窓枠

の縦棒(4)のフランジ(21)、(21)で挟まれて、障子(1)、(2)の傾動を阻止する。つまみ(93)はケース本体(84)の長孔(96)から上方へ突き出ている、錠杆(87)を引込位置に後退させる。その後退にて、錠杆(87)は窓枠の縦棒(4)のフランジ(21)とのかみ合い位置から外側に移動し、解錠状態となつて、障子(1)、(2)の傾動を可能にさせる。

尚外側の障子(1)は上下移動も傾動もできない固定式にしてもよく、障子(1)、(2)の回転中心は各障子の下端でなく上端でもよく、あるいは上下の中間でもよい。障子の回転方向も内倒れの他の外倒れでもよい。

#### 【発明の効果】

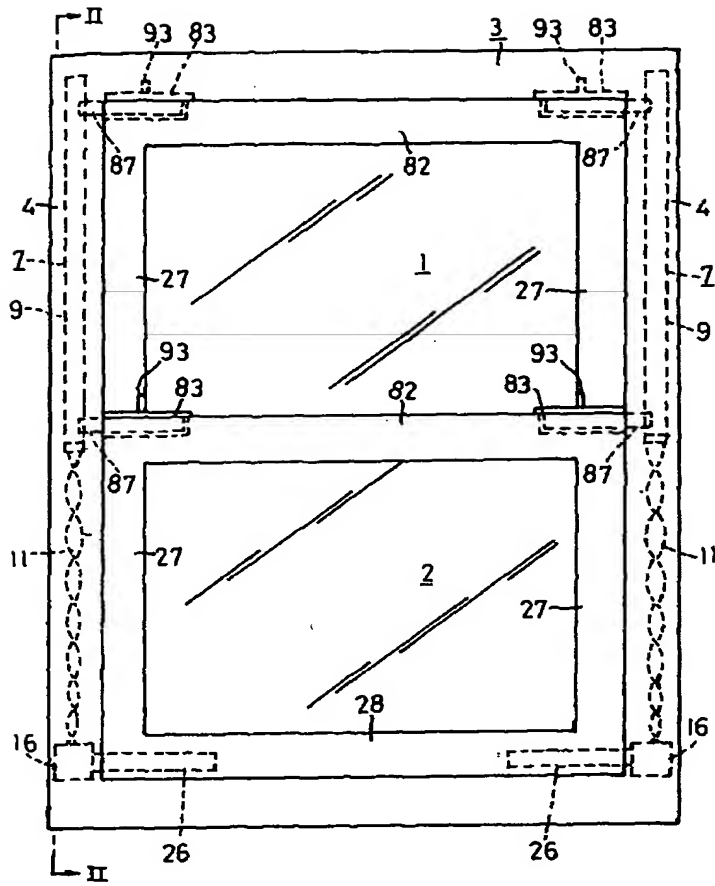
本発明は窓障子と吊り合うねじりばね(15)のねじり力を調整する手段として、ねじりばねを回転させる調整軸(32)に制動片(50)をカム面(51)で押しつけて制動力を与えたり、その制動片の押しつけをカム面で解除可能にして、調整軸に対する制動を解除させるように構成されているので、上下動の窓用の釣合手段の吊合力の調整が確実かつ容易でしかも軽快にでき、吊合力の保持も長期にわたつても確実になされる。本発明はさらに窓障子の前方または後方への傾動に従つて吊合手段に窓障子を連結する摺動体(16)を自動的に制動する制動手段を具備しているため、窓障子の釣合が垂直面と水平面のいずれの面にも保たれて便利である。

#### 【図面の簡単な説明】

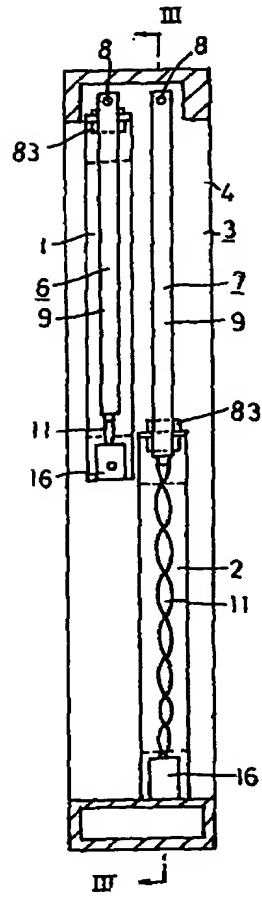
図面は本発明の実施例を示し、第1図は窓の正面図、第2図は第1図のII-II線断面図、第3図は内側障子が上昇位置に引き上げられて一部が省略された第2図のIII-III線断面図、第4図は内側障子が内側に倒された状態を示す第3図のIV-IV線断面図、第5図と第6図は摺動体とねじりばねの調整手段と摺動体用の制動手段との組立状態を示す斜視図、第7図は第5図のVII-VII線断面図、第8図はねじりばね用の調整手段を示す分解斜視図、第9図は第7図のIX-IX線断面図、第10図は摺動体用の制動手段を示す分解斜視図、第11図は第7図のXI-XI線断面図、第12図は第3図のXII-XII線断面図である。

図中(1)と(2)は窓障子、(3)は窓枠、(4)は縦棒、(5)は案内溝、(6)と(7)は吊り合い部材、(8)は連結ピン、(9)は筒、(10)はナット、(11)は螺旋杆、(15)はねじりばね、(16)は摺動体、(20)は摺動溝、(21)はフランジ、(24)は回転軸、(26)は連結腕、(27)は縦框、(28)は下框、(32)は調整軸、(50)は制動片、(51)はカム面、(52)は回転リング、(53)はレバー、(60)は巻きばね、(66)は制動部材、(72)はカム受面、(75)はカム面、(77)は摺動面、(78)は制動面、(79)は案内面、(82)は上框、(83)は施錠部材、(86)はケース、(87)は錠杆、(88)は圧縮コイルばね、(93)はつまみである。

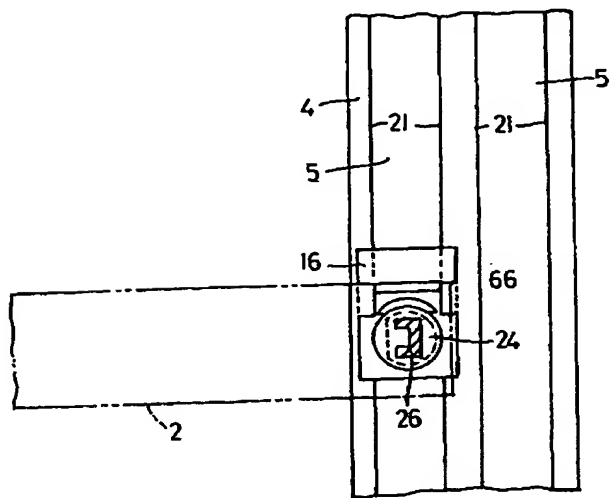
【第1図】



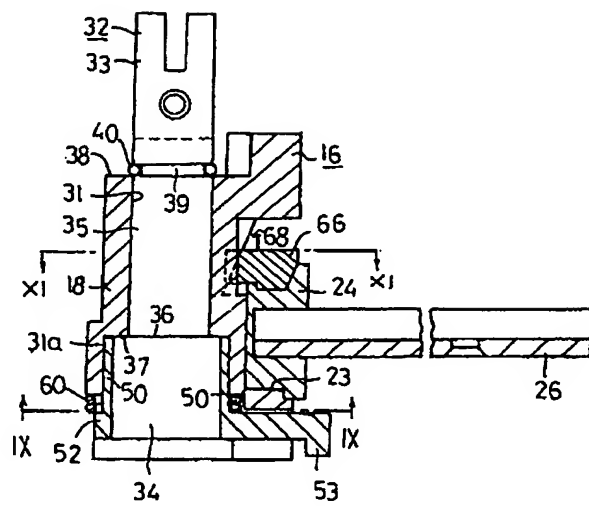
【第2図】



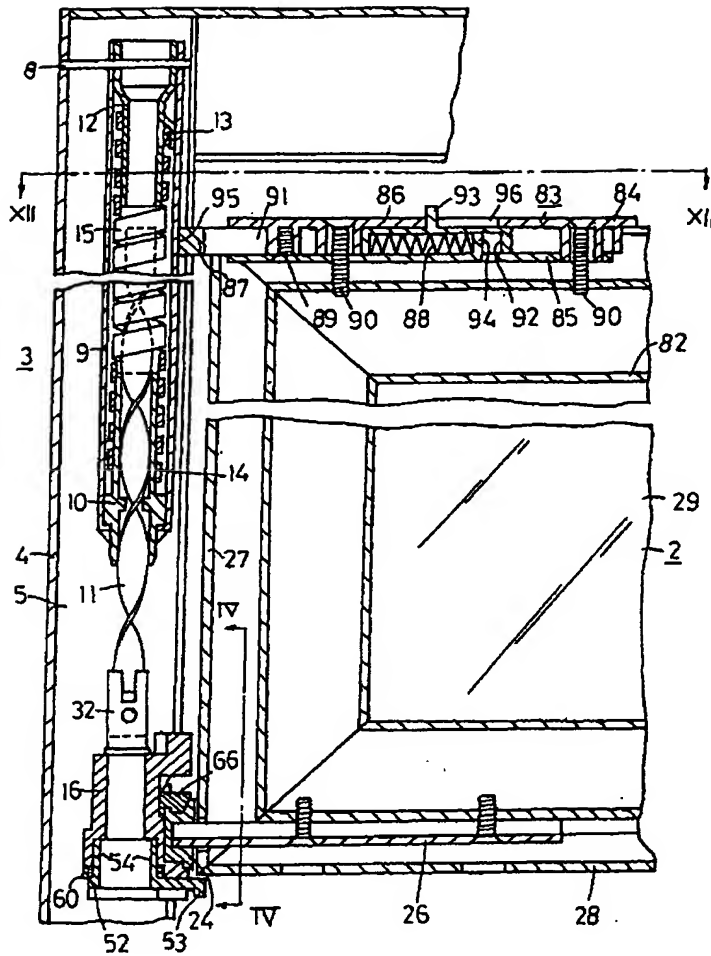
【第4図】



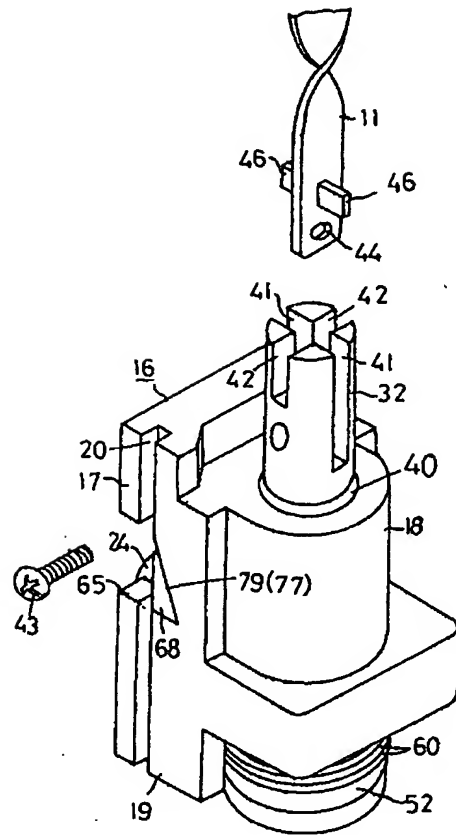
【第7図】



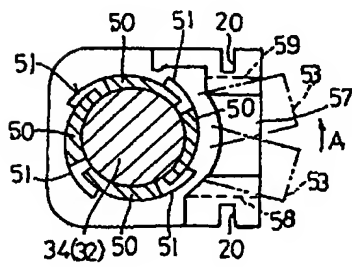
【第3圖】



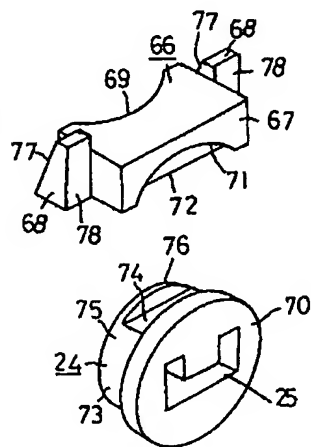
【第6圖】



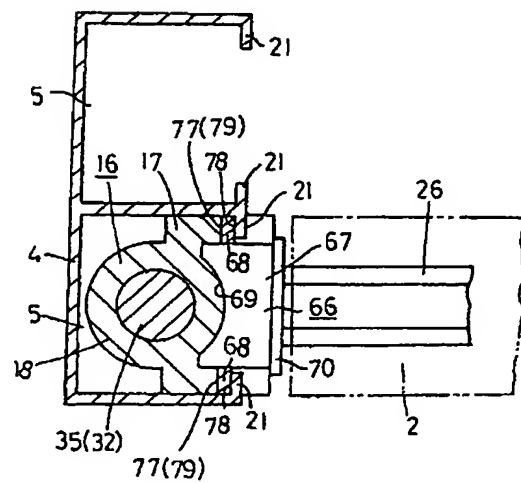
【第9圖】



【第10圖】



【第11圖】





【第8図】

